

## **EXHIBIT #20**

**Re: Request for information, Pursuant to Section 308 of the Clean Water Act  
CEPD-CWA-02-IR-2013-007  
Valley View Park and Valley View Village, Developments Sanitary Wastewater  
Collection Systems (SWWCSs), Caguas PR  
NPDES Tracking Number: PRU002779  
Bayamon Acquisition Proper**

# **TECHNICAL SPECIFICATIONS WASTEWATER TREATMENT PLANT**

**PROJECT: VALLEY VIEW  
CAGUAS, PR**

**SANI-PLANT CO., INC.**  
PO BOX 381, TRUJILLO ALTO PR 00977  
TEL: (787) 761-7272 / FAX: (787) 748-0095

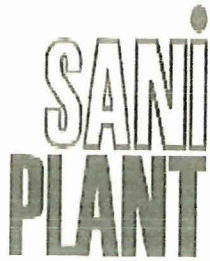


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# **GENERAL SPECIFICATION**



**Technical Specification  
Waste Water Treatment Plant  
Valley View  
Caguas, P.R.**

# SPECIFICATIONS

## VALLEY VIEW, CAGUAS PR

ONE EXTENDED AERATION PROCESS PRECAST CONCRETE SEWAGE  
TREATMENT PLANT FOR A DAILY FLOW OF 17,100 GPD

### PLANT CAPACITY

AERATION CAPACITY  
SETTLING TANK CAPACITY  
CHLORINE CONTACT

### TREATMENT EQUIPMENT

REMOVABLE BAR SCREEN BASKET

FOUR (4) SUBMERSIBLE AERATORS.

ONE (1) CONTROL PANEL WITH AUTOMATIC OPERATION FOR ALL  
ELECTRICAL COMPONENT.

ONE (1) JET INC TABLET CHLORINATOR.

HERMETICALLY SEALED ALUMINIUM HATCH DOORS.

25 GPM FILTRATION UNIT WITH 8 ZONE DRIP SYSTEM.

ONE (1) LIBERTY PUMP, FROTH PUMP.

TWO (2) LIBERTY PUMP, SETTLING TANK.

TWO (2) 25 GPM TURBINE, PUMP TANK.

ALL NECESSARY PIPING AND VALVES.

### DIGESTION SYSTEM EQUIPMENT

ONE (1) SUBMERSIBLE AERATORS.

# PRE FABRICATED CONCRETE WASTEWATER TREATMENT PLANT

The Waste water treatment plant for this project is of an extend aeration type design, consisting of the following components:

- a) Removable bar screen basket.
- b) Precast reinforced concrete aeration chambers.
- c) Precast reinforced concrete settling tank.
- d) Sludge return pumps.
- e) Froth control pumps.
- f) Skimmer return pump.
- g) Adjustable V-notch weir.
- h) Precast reinforced concrete chlorine contact tank with tablet chlorination.
- i) Precast reinforced concrete aerobic digester chamber.
- j) Duplex pumps with head work, fittings , automatic control panel.
- k) Drip irrigation system.
- l) Automatic plant control with timers and all necessary features for complete plant operation.
- m) Hermetically sealed aluminum hatches for servicing of system.

**BASIC DESIGN FORMULA FOR  
VALLEY VIEW  
WASTEWATER TREATMENT PLANT - CAGUAS, P.R.  
(EXTENDED AERATION)**

I. Flow Calculation

Residence:  $57 @ 300 \text{ gal/day.} = 17,100 \text{ gpd}$

**Total Daily Flow: 17,100 gallon per day**

II. Extended Aeration

A. Volume of Aeration Tank

Assumptions: Based on Required Detention

a. **Volume Required**

$$= [17,100 \text{ gpd} \times 7 \text{ day}] / 7 \text{ day} = 17,100 \text{ gal/day} \\ = 17,100 \text{ gal/day}$$

b. **Volume Provided**

$$= L \times A \times P \times (\# \text{ of tanks}) \times 7.48 \text{ gal/ft}^3 \\ = (12'2") \times (6'2") \times (10.75') \times (3) \times (7.48 \text{ gal/ft}^3) \\ = 18,069 \text{ gal}$$

1. Based on Organic Loading

Assumptions:

- ☐ Maximum Organic Loading is specified as 20 lb BOD/1,000 ft<sup>3</sup> Aeration Volume.
- ☐ Sewage Strength: 300 ppm BOD

a. Organic Loading Aeration Tanks

$$= [300 \text{ ppm BOD} \times 8.34 \text{ lb/gal} \times 17,100 \text{ gpd}] / 1,000,000 \text{ ft}^3 \\ = 45.54 \text{ lb BOD day}$$

b. Volume Aeration Tanks

$$= [45.54 \text{ lb BOD/day} \times 1000 \text{ ft}^3 \times 7.48 \text{ gal/ft}^3] / 20 \text{ lb. BOD/day} \\ = 17,030 \text{ gal}$$

2. Oxygen Required for BOD Removal

- a For this application we are using 2 lb. of oxygen per lb. of BOD per day (under field conditions) and 0 lb. of oxygen per lb. A residual oxygen level of 2 mg/l should be maintained at all times.

b

$$45.54 \text{ lb. oxygen/day} \times 2 \text{ mg/l} = 91.08 \text{ lb Oxygen per day}$$

\*\*\*To convert total oxygen to field conditions (STOR) refer to Submersible Aerator Sizing Calculations, sheet attached.

B. Volume of Clarifier Tank

1. Based on Required Detention Time

$$\text{Volume} = \frac{\text{Daily Flow} \times \text{Detention Time}}{24 \text{ hr/day}}$$

Assumption: Require Detention Time = 4 hr (based on average daily flow)

a. Volume Required

$$\begin{aligned} &= (17,100 \text{ gal} \times 4 \text{ hr}) / 24 \text{ hr} \\ &= 2,850 \text{ gal} \end{aligned}$$

b. Volume Provided

$$\begin{aligned} &= [ \{ (V_{\text{bottom}}) + (L \times A \times P) \} \times (\# \text{ of tanks}) ] \times 7.48 \text{ gal/ft}^3 \\ &= [ \{ (6' \times 6'2'' + 4' \times 4') / 2 \times 1'8'' \} + (6' \times 6'2'' \times 5.5') \} \times (2) ] \times 7.48 \text{ gal/ft}^3 \\ &= 3,698 \text{ gal} \end{aligned}$$

C. Surface Settling Rate (SSR) and Re-circulation Rate (SRR) Determination

1. Based on average daily flow

$$\text{SSR} = \text{Daily Flow} / \text{Settling Area}$$

Assumption: Surface Area of Settling Tank = 37 ft<sup>2</sup>

$$\begin{aligned} \text{a. SSR} &= 17,100 \text{ gpd} / (6' \times 6'2'') \text{ ft}^2 \\ &= 462.66 \text{ gpd/ft}^2 \end{aligned}$$

2. Settling Re-circulation Rate (SRR) Determination

$$\text{SRR} = \text{Daily Flow (gpm)} \times \text{Recirculation Rate}$$

Assumption: Required 200% recirculation rate

$$\begin{aligned} \text{SRR} &= (17,100 \text{ gpd} \times 2) / 1440 \text{ min/d} \\ &= 23.75 \text{ gpm} \end{aligned}$$

Provided: One Liberty Pump model LE70 serie.

D. Volume of Chlorine Contact Tank

1. Based on Required Detention Time

$$\begin{aligned} \text{Volume} &= \text{Daily Flow (gpm)} \times \text{Required Detention Time (minute)} \\ &= 17,100 / 1410 = 11.87 \text{ gpm} \end{aligned}$$

Assumption: Required Detention Time = 60 minutes

a. Volume Required

$$\begin{aligned} &= (11.87 \text{ gpm} \times 60 \text{ min}) \\ &= 712.5 \text{ gal} \end{aligned}$$

**b. Volume Provided**

$$\begin{aligned} &= L \times A \times P \times (\# \text{ of tanks}) \times 7.48 \text{ gal/ft}^3 \\ &= (12'2") \times (6'2") \times (10.75') \times (.25) \times (7.48 \text{ gal/ft}^3) \\ &= 1,505 \text{ gal} \end{aligned}$$

**E. Volume of Aerobic Digester**

$$\text{Volume Required} = \frac{\text{Daily Flow} \times \text{ft}^3/\text{capita required} \times 7.48 \text{ gal/ft}^3}{100 \text{ gpd}}$$

**Capacity of digester tank is generally based on 1 to 3 ft<sup>3</sup> per 100 gpd of design flow (or per capita).**

Assumption: Required Volume is based on 2 ft<sup>3</sup> per 100 gpd of design daily flow

**a. Volume Required**

$$\begin{aligned} &= (17,100 \text{ gpd} \times 2 \text{ ft}^3 \times 7.48 \text{ gal/ft}^3) / 100 \text{ gpd} \\ &= 2,558.16 \text{ gal} \end{aligned}$$

**b. Volume Provided**

$$\begin{aligned} &= L \times A \times P \times (\# \text{ of tanks}) \times 7.48 \text{ gal/ft}^3 \\ &= (12'2") \times (6'2") \times (10.75') \times (.5) \times (7.48 \text{ gal/ft}^3) \\ &= 3,011.57 \text{ gal} \end{aligned}$$

**F. AERATION TANK:**

**2. Air Required:**

$$\begin{aligned} &= [300 \text{ ppm BOD} \times 8.34 \text{ lb/gal} \times 18,069 \text{ gpd}] / 1,000,000 \text{ ft}^3 \\ &= 45.54 \text{ lb BOD day} \end{aligned}$$

Oxygen Required for BOD Removal:

$$= 45.54 \text{ lb/O}_2\text{/day} \times 2 \text{ mg/L}$$

$$= 91.08 \text{ lb/O}_2\text{/day} \quad \text{Total of air required for the three (3) tank.}$$

For half each Tank:

$$= 91.08 \text{ lb/O}_2\text{/day} / 3$$

$$= 30.36 \text{ lb/O}_2\text{/day} \quad \text{For each Aeration Tanks.}$$

**3. Air Provided:**

$$= 1.1 \text{ kg O}_2\text{/hr} \times 2.2 \text{ lb/kg} \times 24 \text{ hr/day} \times 0.85$$

$$= 49.36 \text{ lb/O}_2\text{/day} \quad \text{For each Tsurumi model 32-TRN 21.5 Submersible Aerator.}$$

### III. DIGESTOR TANK:

$$= [1,000 \text{ ppm} \times 8.34 \text{ lb/gal} \times 2,558.16 \text{ gpd}] / 1,000,000 \text{ ft}^3$$

$$= 21.33 \text{ lb/O}_2\text{/day}$$

One (1) Tsurumi model 32-TRN 21.5 Submersible Aerator for the Digestor Tanks is provided.

## PRECAST REINFORCED CONCRETE TANKS

All precast concrete tanks will be made of 5000 psi concrete properly reinforced to meet the existing structural concrete codes.

The tanks will be buried and set on top of a reinforced concrete slab properly designed for the conditions of the site.

## REMOVEABLE BAR SCREEN BASKET

A stainless steel bar screen basket with one (1) inch square openings will be installed at the entrance of the equalization tanks and will be capable of being removed for daily maintenance.

## AERATION TANKS

Aeration tanks of the required capacity will be provided to supply the necessary retention time to properly oxidize the organic material. Submersible aerators will be installed inside the tank structures, controlled by the automatic control panel.

## CLARIFIER TANKS

A properly designed clarifier tank will be provided to clarify the aerated water from the aeration tanks. Submersible pumps for returning the settled sludge will be provided and controlled by timers in the control panel. To remove the floating material, a skimmer tank and pump will be supplied inside the clarifier to keep the floatables from going outside the treatment system. A froth control pump will also be installed inside the clarifier chamber to provide water into the aeration chambers so that the floating scum which will be formed as part of the treatment plant system gets suppressed. And adjustable v- notch weir with baffle will also be provided with a trough so that only the clean water from the clarifier will exit into the next chamber.

## CHLORINATION TANK

-A chlorination tank properly-sized to provide a minimum retention period of thirty (30) minutes of chlorine contact time will be provided. A calcium hypochlorite capable of releasing the appropriate amount of dissolved chlorine into the contact chamber.

## DIGESTOR TANK

An appropriately sized aerator digestion tank will be supplied so as to digest the solids removed from the treatment system. The return of the supernatant will be made by gravity back to the aeration tanks.

### AUTOMATIC CONTROL PANEL

The treatment system will be controlled thru a properly designed NEMA 4, control panel which will have all the necessary electrical devices such as magnetic contractor, current overload relays, timers to operate the aerators and pumps inside the system according to the predetermined cycles.

The description of the whole system and the different pieces of equipment above described form part of the drawings accompanying the bid documents.

This type of system meets EQB requirements for a 15 mts radius reduced buffer zone.

This type of system meets EQB requirements for a 15 mts radius reduced buffer zone.

Job Description:	wwtp 17100 GPD in 4 phases @ 4275 GPD per phase
Contact:	Valley View Park
Prepared by:	
Date:	11 nov. 2010

Please fill in the shaded areas and drop down menus below:

Note. This worksheet can be found in Geoflow's Design and Installation Manual

### Worksheet - Field Design

		Dispersal Field as Single Zone	Dispersal Field as Multiple Zones	
Number of Zones		1	8	zone(s)
A)	Quantity of effluent to be disposed per day	17,100	2,138	gallons / day
B)	Hydraulic loading rate	0.4	0.4	gallons / sq.ft. / day
C)	Determine total area required	42,750	5,344	square ft.
D)	Choose spacing between WASTEFLOW lines	2	2	ft.
D)	Choose spacing between WASTEFLOW emitters	2 ft. 2	2	ft.
E)	Total linear ft.	21,375	2,672	each
F)	Total number of emitters	10,688	1,336	each
G)	Select Wasteflow dripline	Wasteflow PC - 1/2gph 2	Wasteflow PC 1/2 gph	dripline
H)	Pressure at the beginning of the dripfield	20 psi 20	20	psi
I)	Feet of Head at the beginning of the dripfield	46.2	46.2	ft.
J)	What is the flow rate per emitter in gph?	0.61	0.53	gallons per hour
K)	Total flow for the area (gph)	6,519	708	gallons per hour
	Total flow for the area (gpm)	108.66	11.80	gallons per minute
L)	Select pipe diameters for manifolds and submains	4	1.25	inch
M)	Select Vortex Filter (item no.)	AP4E-2F-4 (2in./4holes)	AP4E-1F (1in.)	
N)	Maximum length of each WASTEFLOW line. For additional technical flow, pressure and flushing data please refer to Geoflow's Design Manual and WASTEFLOW hydraulics worksheet.	424	424	ft.

Check below to choose quantity and length of daily doses

Dosing			
Number of doses per day/zone:	12	12	
Pump run time per dose/zone (minutes):	13.11	15.09	minutes
Pump run time per day/zone (hours):	2.62	3.02	hours / day
Pump run time per day/all zones (hours):	2.62	24.15	hours

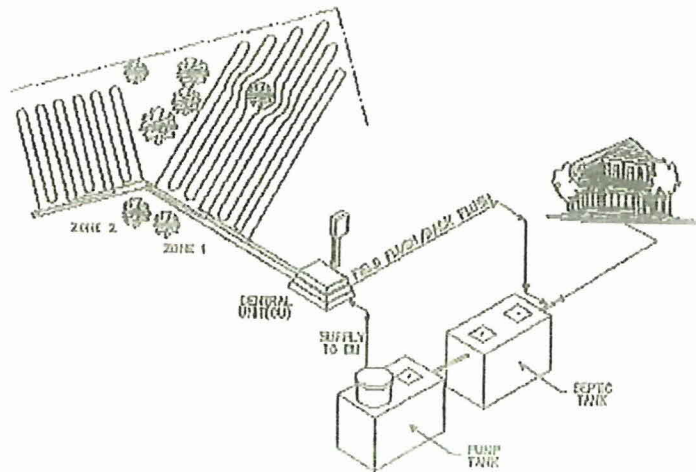
Dripline Volume			
Tubing	Inside diameter	0.55	0.55 inches
Total length of WASTEFLOW dripline / zone		21,375	2,672 ft
Total Volume in dripline / zone		263.83	32.98 gallons

A NEW! kind of DISPOSAL SYSTEM

**"Perc & Rite"®**

By American Manufacturing Company, Inc.

ALTERNATIVE DRAINFIELD



~ECOLOGICAL ~ECONOMICAL ~EASY TO INSTALL ~OFF THE SHELF

SIMPLY AMAZING!

THE ONLY DRIP IRRIGATION SYSTEM FOR SEPTIC EFFLUENT  
NO OTHER TREATMENT REQUIRED! PATENT NO. 5,200,065

#### OPERATION

The system control panel is equipped with four float switches and controls the timed doses to be discharged. The water level must be high enough to overcome the "Redundant Off" (Bottom) float in order for the pump to run. When the water level rises high enough to overcome the "Dose Enable" (second) float and the timer is in a dose enable mode the cycle will initiate. The pump will activate and automatically back flush the disc filters, and then dose the lead zone. The pump will continue to run for the length of time as set on the pump run timer to provide a complete dose. The system will remain off until the preprogrammed off timer enters a new cycle enable mode, at which time the control will activate another cycle and dose the new lead zone (as long as the "Dose Enable" float is still up). This process will continue until the water level drops below the "Dose Enable" float and the pump run timer has timed out. Each zone will automatically receive a field flush each 50 cycles to clean the drip tubing.

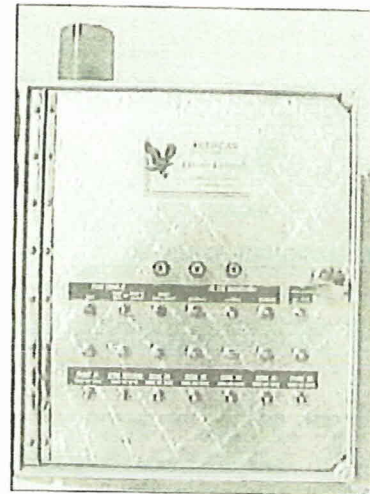
The control system is equipped with a peak enable circuit to manage peak flows and excess water use event. If the water level rises enough to overcome the "peak enable" (third) float and the peak enable selector switch is on, the system will be cycled at the peak rate. The system will continue to cycle at an increased rate until the peak enable float is deactivated at which time the system will resume the normal dosing cycle.

In the event the water level continues to rise enough to overcome the "High Level" (fourth) float, the audio/visual alarm will be activated until silenced by pressing the Test-Normal-Silence switch to the silence position. The alarm circuit must be reset when the "High Level" float returns to its normal position.

## DRIP SYSTEM PACKAGE SPECIFICATION

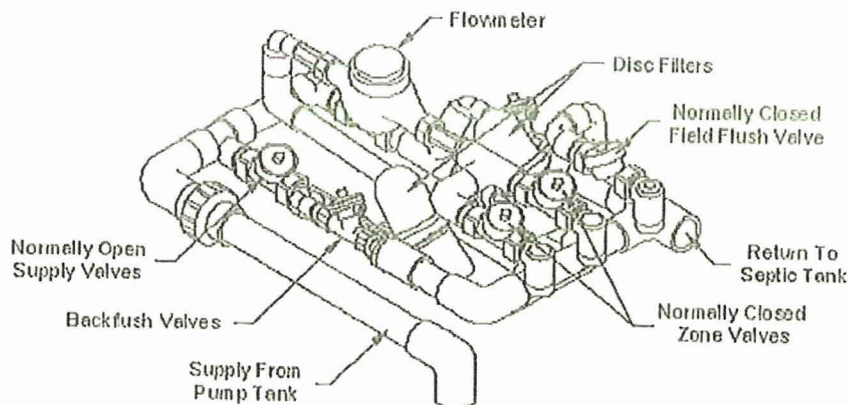
### CONTROL

The control has a Nema 4X rated enclosure with hinged inner door, removable aluminum back plate for component mounting, IEC rated pump contactor, adjustable pump run timer, high level peak enable circuit, Hand-Off-Auto toggle switches for all operations, pump run light, indicator lights, separate control and pump breakers, control fuse, and finger-safe terminal blocks with a neatly bundled wiring harness. The Control unit is U.L. APPROVED AND LABELED. The microprocessor has manual override capability to completely operate the system while bypassing the microprocessor.



### TUBING and FIELD FITTINGS

Netafim Ram tubing in 1,000 foot rolls with specialty insert fittings and PVC flex tubing is provided ready to glue to schedule 40 PVC supply & return pipes.

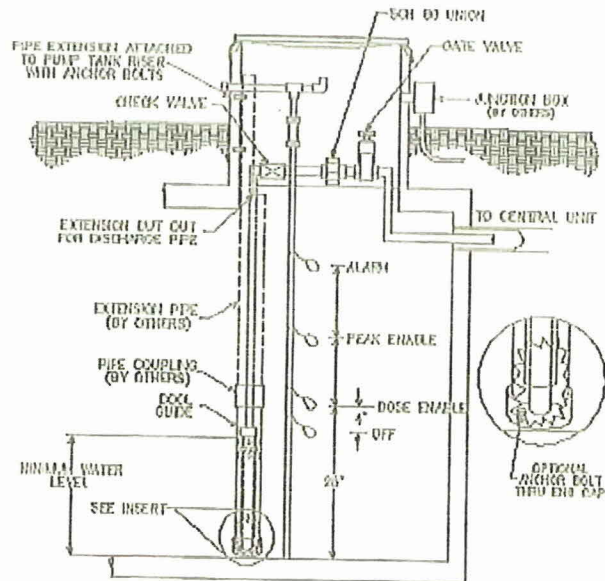


## HYDRAULIC UNIT (HU) w/INSULATED ENCLOSURE

The hydraulic unit is mounted on an aluminum skid, heated, and enclosed in an at grade polyethylene insulated valve box with bolt down cover. The Control valves and heater are pre-wired with a 15' cord suitable for connection to the control terminal strips.

## SUBMERSIBLE PUMP

The pump is a 2 hp, 230-volt, 1 phase septic effluent pump with 1/2" solids handling capacity. Available also is a 1/2 hp, 115 volt, 1 phase screened effluent pump with quick disconnect at reduced cost.



## PUMP DISCHARGE KIT & FLOAT ROD W/FLOATS

Included in package is a shut off valve, quick disconnect, check valve, and adapters, no weep hole should be placed in pipe. Vertical float installation is recommended as shown.

## ACCESS HATCH AND RISER

Lightweight riser and lid is an available option.

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AMERICAN



DRIP DISPERSAL SYSTEMS

# RESIDENTIAL PERC-RITE®

PATENT NO. 5,200,065

PATENT NO. 5,984,574

PATENT NO. 6,261,452B1



**Disperse Economically, Effectively, Permanently**

**Innovative Technology  
for the Environmental Age**

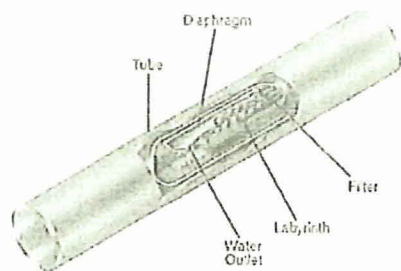
American Manufacturing Company, Inc. 1-800-345-3132  
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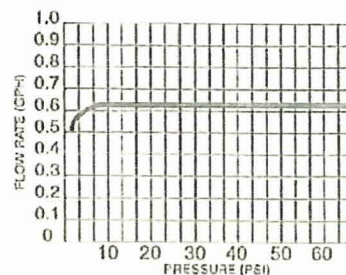
## PERC-INTITE® DRIP SYSTEM

The system control panel is equipped with four float switches and controls the timed doses to be discharged. The water level must be high enough to overcome the "Redundant Off" (Bottom) float in order for the pump to run. When the water level rises enough to overcome the "Dose Enable" (second) float and the timer is in a dose enable mode the cycle will initiate. The pump will activate and automatically backflush the disc filters then dose the lead zone. The pump will continue to run for the length of time as set on the pump run timer to provide a complete dose. The system will remain off until the preprogrammed time enters a new cycle enable mode, at which time the control will activate another cycle and dose the new lead zone (as long as the "Dose Enable" float is still up). This process will continue until the water level drops below the "Dose Enable" float and the pump run timer has timed out. Each zone will automatically receive a field flush each 25 cycles to clean the drip tubing.

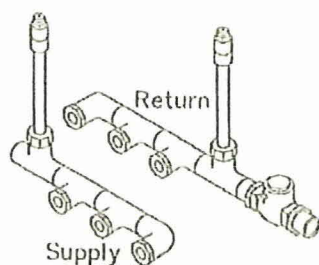
The control system is equipped with a peak enable circuit to manage peak flows and excess water use event. If the water level rises enough to overcome the "peak enable" (third) float and the peak enable selector switch is on, the system will be cycled at the peak (design) rate. The system will continue to cycle at an increased rate until the peak enable float is deactivated at which time the system will resume the normal dosing cycle. In the event the water level continues to rise enough to overcome the "High Level" (fourth) float, the audio/visual alarm will be activated. This condition alerts excess water use in addition to possible mechanical failures.



The construction of the "bioline" drip tubing is unique in that the internal diaphragm and labyrinth provided for an exact amount of effluent to be discharged from each of its emitters which are normally spaced at two foot intervals along the entire length. Each emitter maintains a constant flow over pressure ranges of 7 to 70 psi. Because the effluent is distributed at an ultra low rate, large quantities of effluent may be economically distributed over large areas during controlled periods of time without saturating the surrounding soil.



For slopes over 10%, systems must be designed with top feed manifolds to control draindown after the pump shuts off.



Patent No. 5,984,574

TOP FEED MANIFOLD

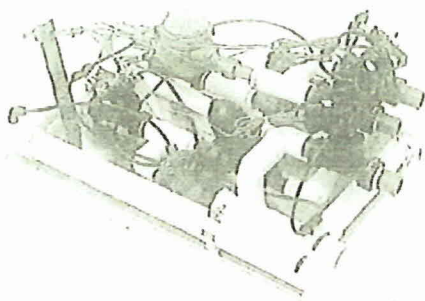


DRIP TUBING

## from WASTE WATER DISPERSAL

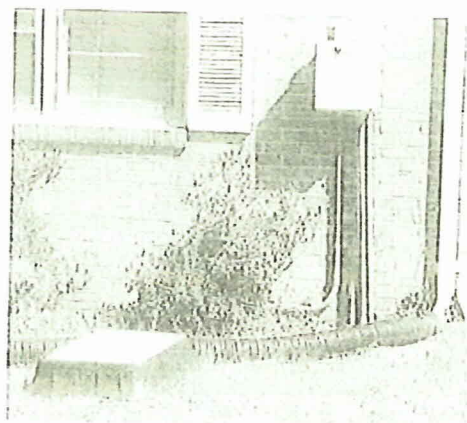
### AIR & VACUUM RELEASE

The dual action air release valve vents air out of the piping network during filling and as important, allows air out of the system after the pump shuts off. Air release valves are provided with the zone return kit for each zone.

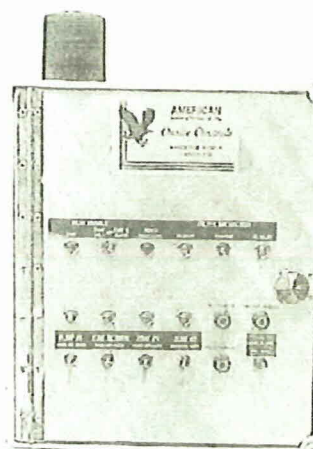


### HYDRAULIC UNIT

Disc Filtration - The submersible pump delivers unfiltered effluent to the unit. The filter backflushing schedule is triggered at the beginning of each dose cycle. One filter valve closes, thus blocking the flow of unfiltered effluent to that filter thereby backflushing the unused filter. The accumulated impurities discharge back into the pretreatment unit. The closing and opening procedure of the filter and back flush valves causes a change of flow within the unit to provide filtered water from one filter to backflush the other.



### HYDRAULIC UNIT AND CONTROL INSTALLATION



### SIMPLEX CONTROLS

Three or four float simplex or duplex controls provide duty rated contactors and efficient operator interface.

### OPERATION AND MAINTENANCE

The *Perc - Rite*® drip dispersal system provides a user friendly operator interface with no programming skill necessary to operate system. The only thing that varies is the run time. Each mechanical component has a H-O-A switch (Hand-Off-Auto) which can be used to check component operation.

Dialers and remote monitoring are available at additional cost. Data acquisition through a hand held computer device can collect substantial operational data. Please check our web site for more details.



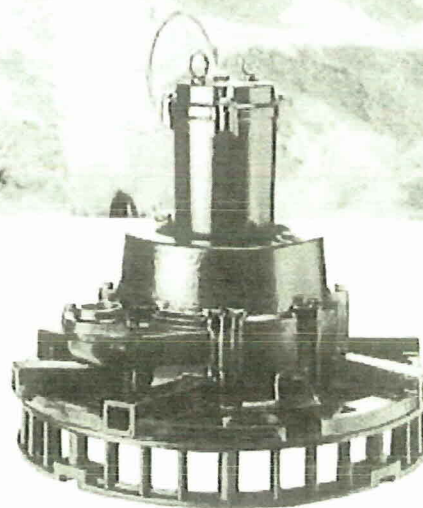
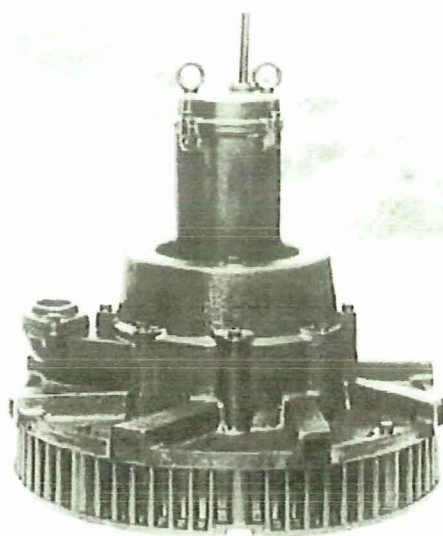
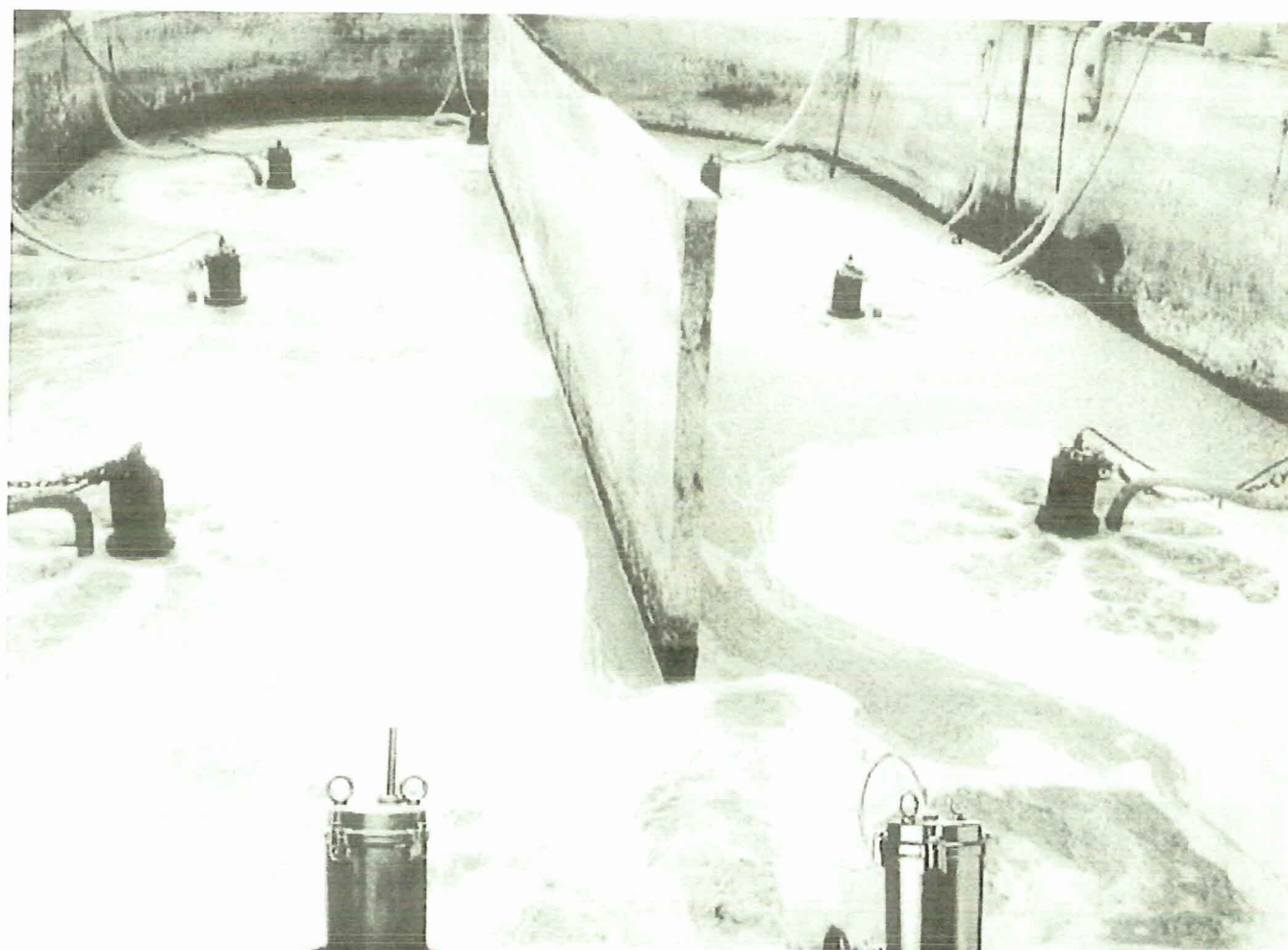
# Tsurumi TR/N

400V  
50Hz

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## Submersible Aerators

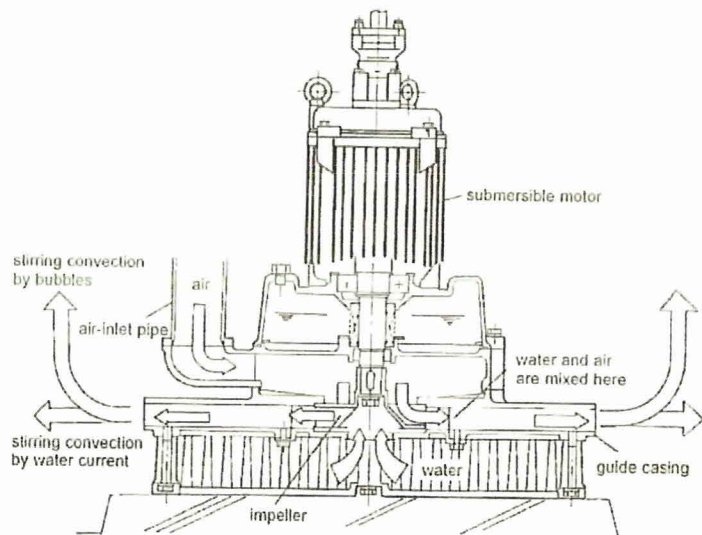
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# This is the Final Answer to All Aeration

The structure of the model TR/TRN Tsurumi Submersible Aerator employs an impeller connected directly to the motor. As can be seen in the illustration, the rotation of this impeller creates a centrifugal force in the water, and through this centrifugal force an area of negative pressure appears at the periphery of the impeller. The result is a selffeeding force which draws air from the atmosphere through an air-inlet pipe. The air sucked down into the water is subjected to an air/water collision within the guide casing, and then this fine intimate mixture is forcibly discharged through the discharge outlets. The results of this include the following: an airwater

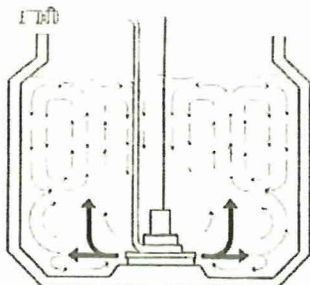
mixture effect caused by the collision of air and water with the guide casing, a circulation and convection effect caused by the air-water-mixture current discharged from the discharge outlets and, in addition, an extremely high efficiency of oxygen saturation caused by a high level of oxygen movement resulting from the presence of a large amount of air molecules. Furthermore, there is absolutely no fear of the motor becoming moistened because the design of the structure allows the air which is sucked into it to pass beneath the motor forming a layer of air between the motor and the water.



## Features

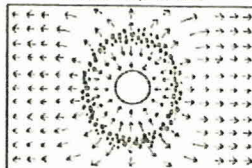
- Higher oxygen dissolution efficiency  
wide reach and excellent oxygenation efficiency thanks to the large percentage of microscopic bubbles
- No dead areas in the pit  
a strong, massive horizontal movement of aerated and entrained water, the prerequisite for thorough scrubbing of the corners and bottom of the pit
- Simplicity, durability, compactness  
the bearings are oversized, so is the shaft seal's oil bath, and the air drawn into the impeller prevents water from touching the shaft seal during operation, making for long trouble free life in 24h/24h continuous operation

## CONVECTION PATTERN

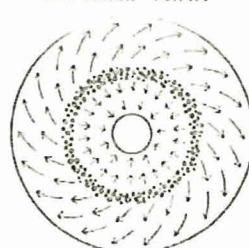


Rectangular Tank

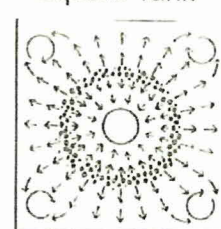
length proportion of tank is 1:1.5 or less



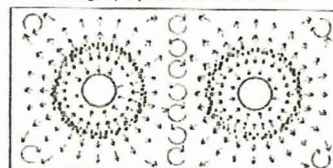
Circular Tank



Square Tank

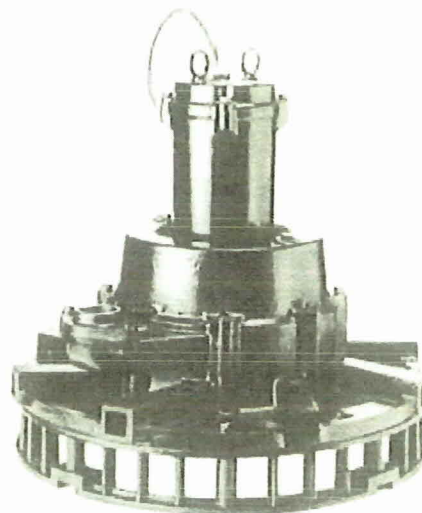


length proportion of tank is 1:2



## ADVANTAGES

- perfect stirring
- performance remains unchanged over the years
- simple construction, durable, main material cast iron
- mechanical seal is not in contact with water during operation
- oversized oil chamber
- simple installation and maintenance
- no spray water, no noise
- absolutely winter-proof
- no clogging
- more than 10.000 units installed during the last 20 years

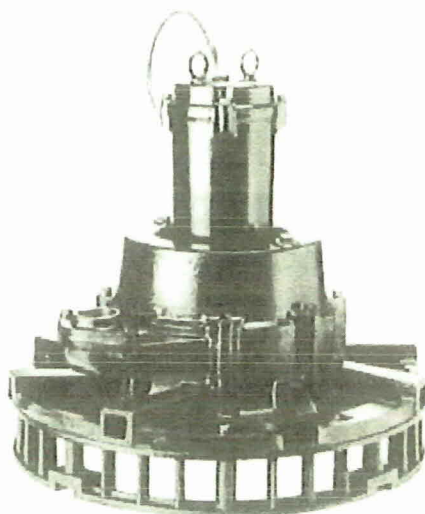


The **TRN model** has a semi-vortex design, not needed in the larger **TR models**, to avoid chips and fibres clogging the impeller.

## USES

- pre-aeration
- activated sludge
- sludge stabilization
- neutralisation
- flotation





### Standard Accessories:

- Silencer & Valve Set
- Lifting Chain (5m)

The open impeller of the TR model draws a, for the motor size, large mass of water through the aerator's large-diameter strainer. It spreads all this water horizontally in all directions. The top side of the impeller is hollow and allows air, drawn through a suction hose, to fill the space around the shaft seal and mix itself with the water around the impeller. This results in a large displacement of water filled with tiny air bubbles. In other words, perfect aeration.

The TRN model has a semi-vortex design, not needed in the largest sizes, to avoid chips and fibres clogging the impeller.

Only cast iron is in contact with the water. Shaft, screws, impeller and wear plate are of stainless steel. Some users attach zinc anodes for additional protection that they need. The heart of the aerator is the double mechanical seal with SiC/SiC rings, cooled by an oil bath of at least 0,5 litre per kW.

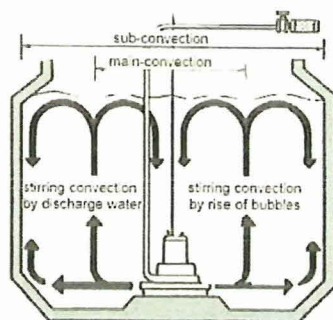
model	motor output kW	rated current A	phase	r.p.m	starting method	air inlet diameter mm	max. impeller depth	no. of outlets	noise level dbA	dry weight kg	cable length m
8-TRN3	0,75	1,8	3	2850	d.o.l.	32	3,2 m	6	60	62	10
15-TRN3	1,5	3,5	3	2850	d.o.l.	32	3,2 m	6	61	62	10
22-TRN3	2,2	5,3	3	1450	d.o.l.	50	3,6 m	8	63	165	10
37-TRN3	3,7	8,6	3	1450	d.o.l.	50	3,6 m	8	65	175	10
55-TRN3	5,5	12,1	3	1450	d.o.l./s.-d.	50	3,6 m	8	66	210	10
75-TRN3	7,5	15,9	3	1450	d.o.l./s.-d.	80	4,1 m	8	67	230	10
110-TRN3	11	23,8	3	1450	s.-d.	80	4,7 m	8	69	250	10
150-TR3	15	31,9	3	1450	s.-d.	80	4,7 m	8	70	260	10
220-TR2	22	48,0	3	1450	s.-d.	100	5,0 m	8	74	530	10
300-TR2	30	65,0	3	1450	s.-d.	150	5,0 m	8	76	700	10
370-TR2	37	75,0	3	1450	s.-d.	150	5,0 m	8	77	700	10

Dry weight of the pump without cable.

### Convection Pattern:

**main-convection:**  
direct oxidation by bubbles

**sub-convection:**  
indirect oxidation by convectional stirring



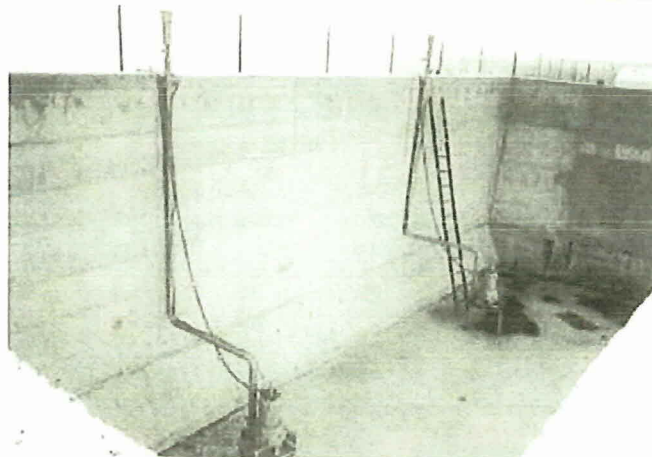
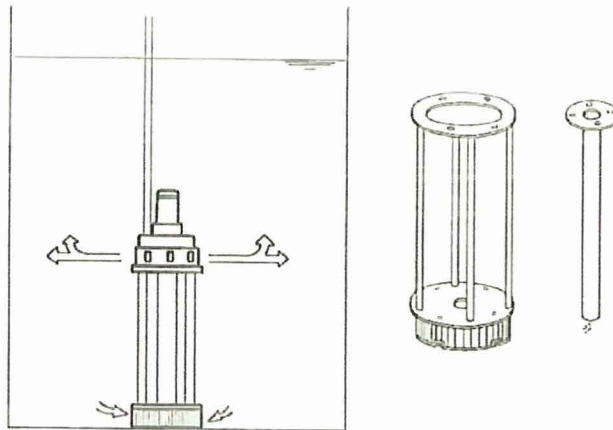
model	max. impeller depth	main-convection diameter	sub-convection diameter
8-TRN3	3,2 m	1,0 m	1,8 m
15-TRN3	3,2 m	1,4 m	2,4 m
22-TRN3	3,6 m	2,3 m	4,7 m
37-TRN3	3,6 m	2,8 m	5,7 m
55-TRN3	3,6 m	3,3 m	6,7 m
75-TRN3	4,1 m	4,3 m	8,6 m
110-TRN3	4,7 m	4,8 m	9,6 m
150-TR3	5,0 m	5,5 m	11,0 m
220-TR2	5,0 m	6,0 m	12,0 m
300-TR2	5,0 m	6,3 m	12,5 m
370-TR2	5,0 m	6,5 m	13,0 m

The motor is of conventional three phase squirrel cage design, except for the following:

- the bearings are oversize (check in parts lists of the sectional views on page 11 and 12)
- the cable gland has the naked leads enclosed in cast epoxy to avoid leakage into the motor in case of cable damage
- d.o.l. started motors have a self resetting thermal cut-out (motor protector), SD started motor have three temperature switches in series, for connection in series with the owner's motor starter solenoid coils.
- the double SiC/SiC shaft seal is cooled and lubricated by an oil bath much larger than that of any submersible pump of comparable power.

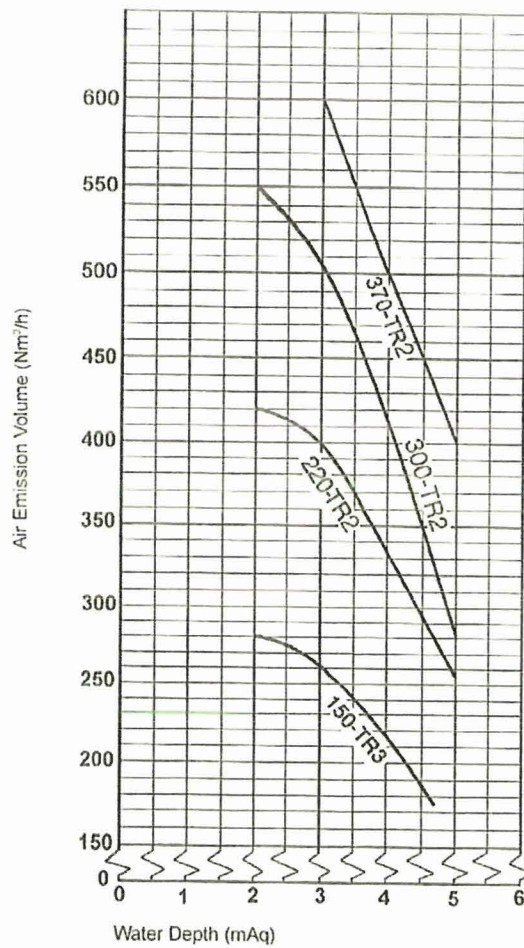
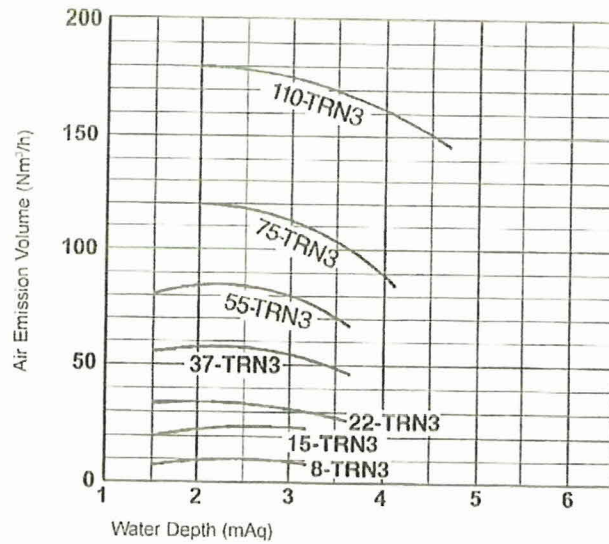
By hanging the aerator from a raft or bridge, or by mounting the aerator on a high pedestal, discharge height can be chosen independently of water depth.

In the case of a pit, it is easy for the installation firm to fabricate a pedestal without need for drawings. The strainer unbolts from the suction plate. A **draft tube** can be flange bolted to the suction plate and reach down into the strainer. The strainer can be covered by a plate (with opening for the draft tube) fitted with legs reaching upwards to carry the aerator. In operation in a pit, the horizontal stream of bubbles and water impinges against the pit walls, one part rising, the other sliding down along the walls and bottom back to the strainer, even when the aerator is used in a thus elevated position.



## Air Emission Volume-Water Depth Curve

(at 20°C, air emission value may vary  $\pm 5\%$ )

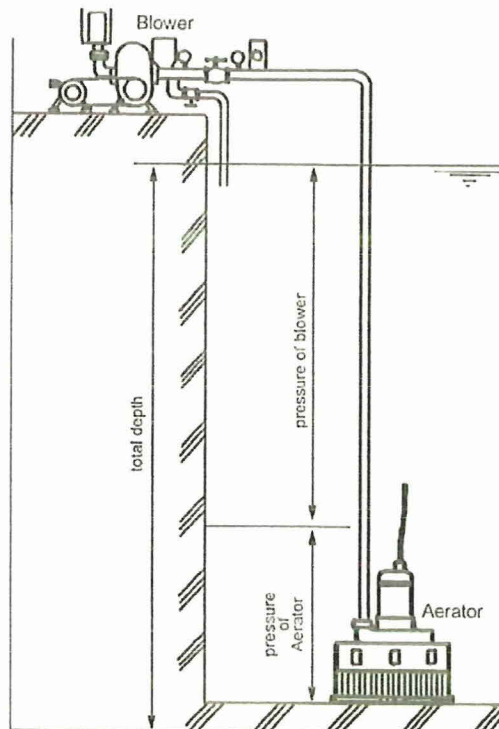


## USE OF PRESSURISED SYSTEM

This is a method of deep layer aeration using TSURUMI Submersible Aerators of the TR/TRN-series.

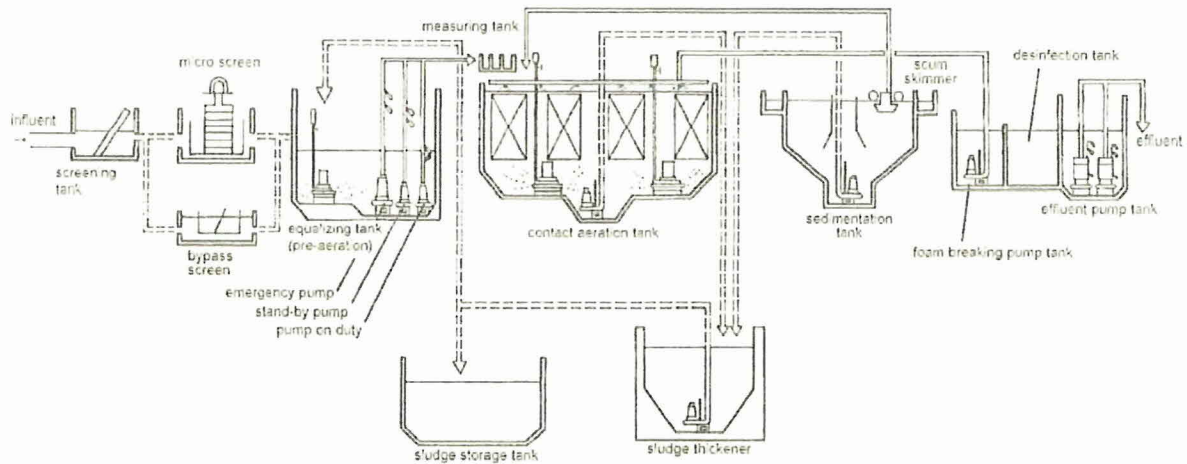
For example a nine meter deep tank may be pressurized to a depth of six meters by the action of a rotary blower and then the remaining three meters may be treated by the suction of the aerator.

The adoption of this system can greatly decrease the power necessary by only the blower in order to aerate the same area.

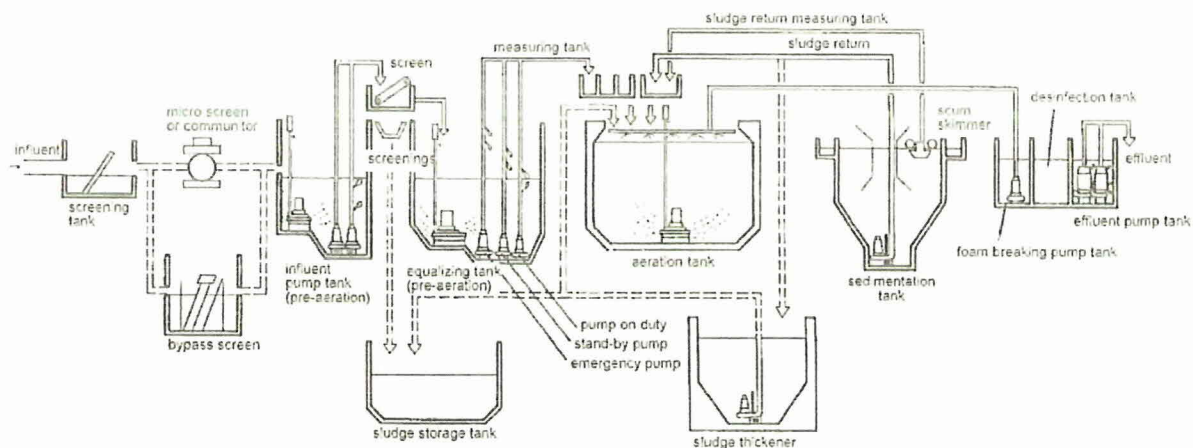


# EXAMPLE OF INSTALLATION FOR TREATMENT PROCESS

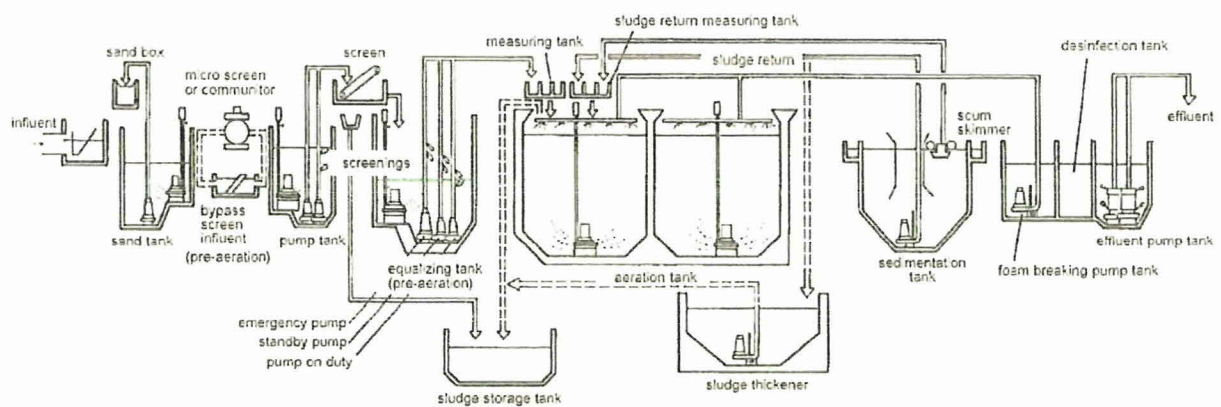
## Contact Aeration Process



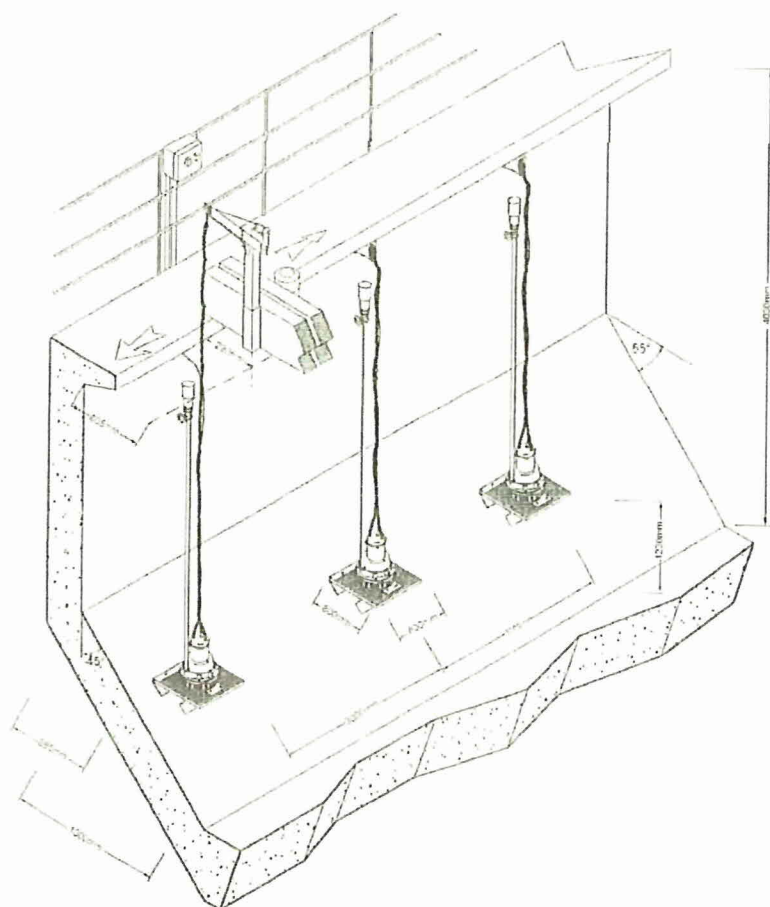
## Extended Aeration Process



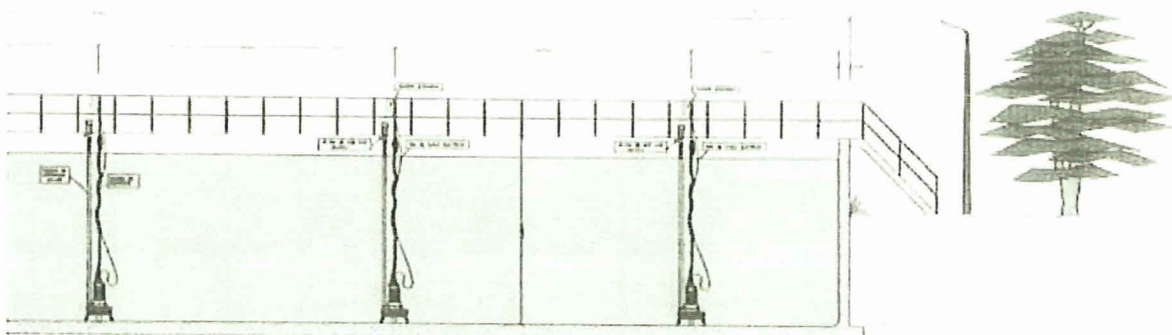
## Conventional Activated Sludge Process



## EXAMPLE OF INSTALLATION OF 15-TRN3

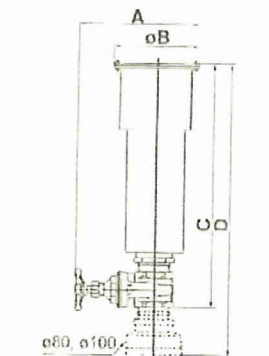


## EXAMPLE OF INSTALLATION OF 150-TR3



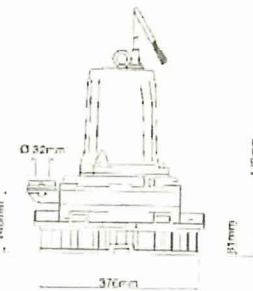
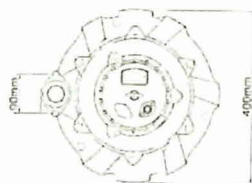
# DIMENSIONS Unit: mm

Silencer & Valve Set

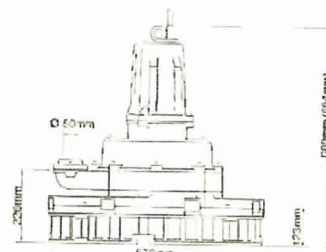
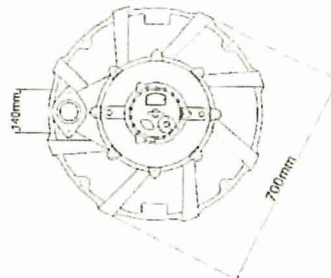


air pipe bore	A	B	C	D
ø32	180	116	275	-
ø50	230	154	370	-
ø80	245	180	-	585
ø100	345	256	-	760
ø150	465	370	-	863

8-TRN3 / 15-TRN3

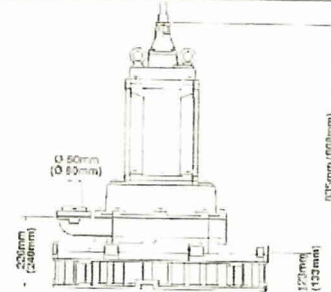
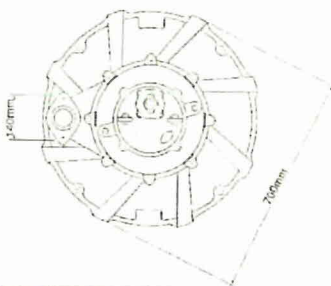


22-TRN3 / 37-TRN3



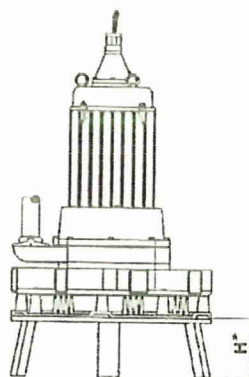
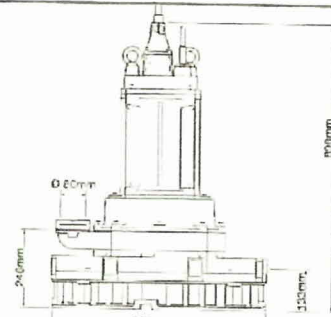
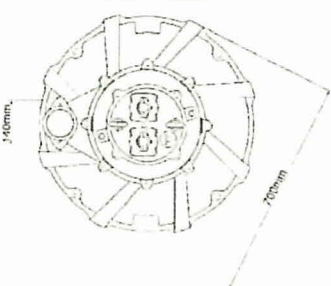
values in ( ) for 37-TRN3

55-TRN3 / 75-TRN3



values in ( ) for 75-TRN3

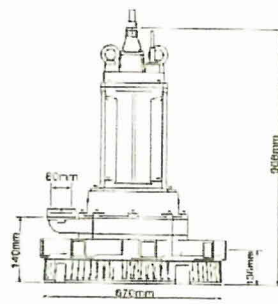
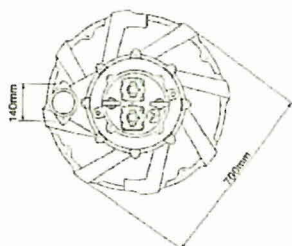
110-TRN3



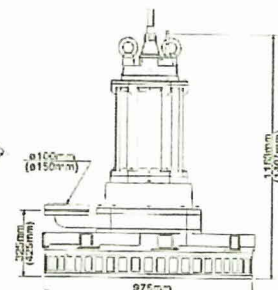
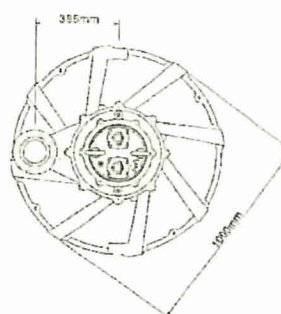
model	H*
8-TRN3	150
15-TRN3	150
22-TRN3	200
37-TRN3	200
55-TRN3	200
75-TRN3	200
110-TRN3	200
150-TR3	200
220-TR2	200
300-TR2	200
370-TR2	200

\*recommended height if no other data is available

150-TR3



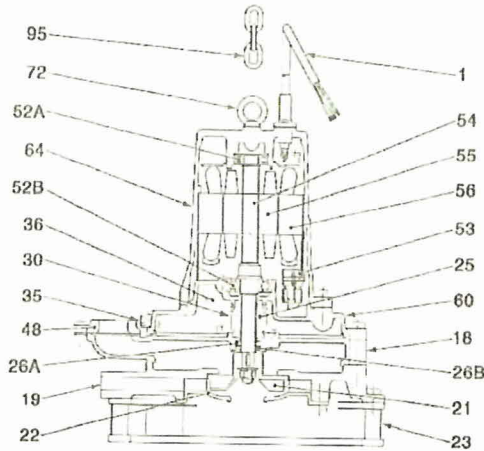
220-TR2 / 300-TR2 / 370-TR2



values in ( ) for 300-TR2 and 370-TR2

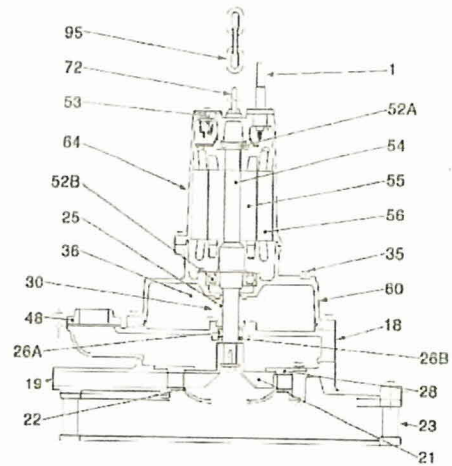
# DESIGN AND MATERIALS

8-TRN3 / 15-TRN3



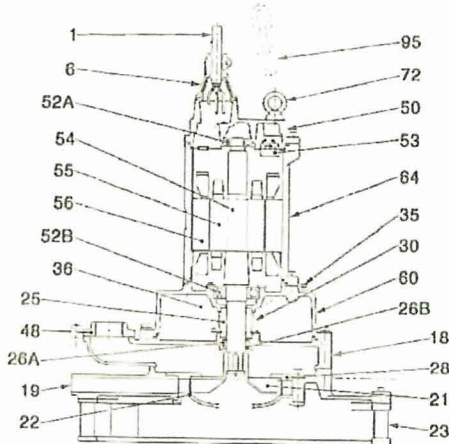
No.	DESCRIPTIONS	MATERIAL	No.	DESCRIPTIONS	MATERIAL
1	Cable	H07RN-F	52A	Bearing Upper	Ball Bearing
18	Air Passage	EN-GJL-200	52B	Bearing Lower	Ball Bearing
19	Guide Vane	EN-GJL-200	53	Motor Protector	
21	Impeller	DIN GX5CrNi19-10	54	Shaft	EN-X30Cr13
22	Suction Cover	DIN GX5CrNi19-10	55	Rotor	
23	Strainer Stand	EN-GJS-450-10	56	Stator Complete	
25	Mechanical Seal	Silicon Carbide	60	Bearing Housing	EN-GJL-200
26A	Distance Piece	Carbon Steel Pipe	64	Motor Frame	EN-GJL-200
26B	Oil Seal	Nitrile Rubber	72	Lifting Eye Bolt	EN-X5CrNi18-10
30	Oil Lifter	Plastic	95	Lifting Chain	DIN 1.0040, 5m
35	Oil Plug	EN-X5CrNi18-10			
48	Lubricant	ISO VG32			
52	Screw Flange	EN-GJL-200			

22-TRN3 / 37-TRN3



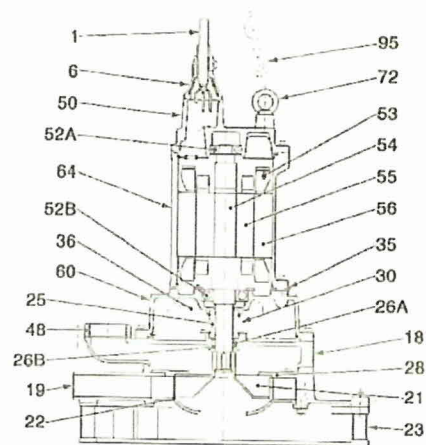
No.	DESCRIPTIONS	MATERIAL	No.	DESCRIPTIONS	MATERIAL
1	Cable	H07RN-F	48	Screw Flange	EN-GJL-200
18	Air Passage	EN-GJL-200	52A	Bearing Upper	Ball Bearing
19	Guide Vane	EN-GJL-200	52B	Bearing Lower	Ball Bearing
21	Impeller	DIN GX5CrNi19-10	53	Motor Protector	
22	Suction Cover	DIN GX5CrNi19-10	54	Shaft	EN-X30Cr13
23	Strainer Stand	EN-GJS-450-10	55	Rotor	
25	Mechanical Seal	Silicon Carbide	56	Stator Complete	
26A	Distance Piece	Carbon Steel Pipe	60	Bearing Housing	EN-GJL-200
26B	Oil Seal	Nitrile Rubber	64	Motor Frame	EN-GJL-200
30	Oil Lifter	Plastic	72	Lifting Eye Bolt	DIN 1.0040
35	Oil Plug	EN-X5CrNi18-10	95	Lifting Chain	DIN 1.0040, 5m
48	Lubricant	ISO VG32			

55-TRN3 / 75-TRN3



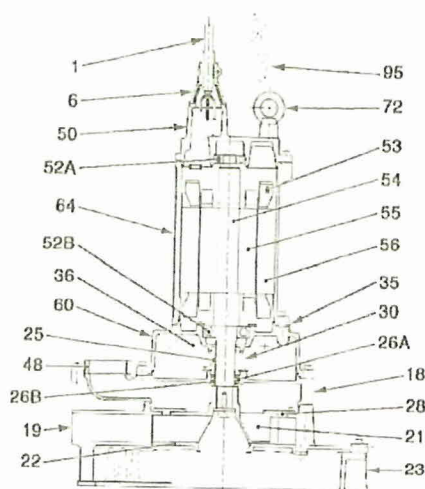
No.	DESCRIPTIONS	MATERIAL	No.	DESCRIPTIONS	MATERIAL
1	Cable	H07RN-F	35	Lubricant	ISO VG32
6	Stuffing Box	EN-GJL-200	48	Screw Flange	EN-GJL-200
18	Air Passage	EN-GJL-200	50	Motor Bracket	EN-GJL-200
19	Guide Vane	EN-GJL-200	52A	Bearing Upper	Ball Bearing
21	Impeller	DIN GX5CrNi19-10	52B	Bearing Lower	Ball Bearing
22	Suction Cover	DIN GX5CrNi19-10	53	Motor Protector	
23	Strainer Stand	EN-GJS-450-10	54	Shaft	EN-X30Cr13
25	Mechanical Seal	Silicon Carbide	55	Rotor	
26A	Distance Piece	Carbon Steel Pipe	56	Stator Complete	
26B	Oil Seal	Nitrile Rubber	60	Bearing Housing	EN-GJL-200
30	Oil Lifter	Plastic	64	Motor Frame	EN-GJL-200
35	Oil Plug	EN-X5CrNi18-10	72	Lifting Eye Bolt	DIN 1.0040
			95	Lifting Chain	DIN 1.0040, 5m

110-TRN3



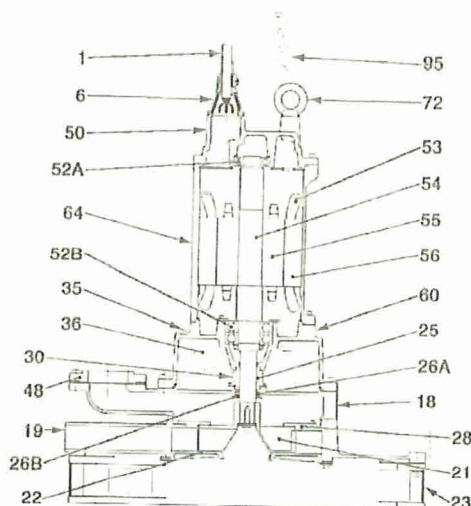
No.	DESCRIPTIONS	MATERIAL	No.	DESCRIPTIONS	MATERIAL
1	Cable	H07RN-F	35	Lubricant	ISO VG32
6	Stuffing Box	EN-GJL-200	48	Screw Flange	EN-GJL-200
18	Air Passage	EN-GJL-200	50	Motor Bracket	EN-GJL-200
19	Guide Vane	EN-GJL-200	52A	Bearing Upper	Ball Bearing
21	Impeller	DIN GX5CrNi19-10	52B	Bearing Lower	Ball Bearing
22	Suction Cover	DIN GX5CrNi19-10	53	Motor Protector	
23	Strainer Stand	EN-GJS-450-10	54	Shaft	EN-X30Cr13
25	Mechanical Seal	Silicon Carbide	55	Rotor	
26A	Distance Piece	Carbon Steel Pipe	56	Stator Complete	
26B	Oil Seal	Nitrile Rubber	60	Bearing Housing	EN-GJL-200
30	Oil Lifter	Plastic	64	Motor Frame	EN-GJL-200
35	Oil Plug	EN-X5CrNi18-10	72	Lifting Eye Bolt	DIN 1.0040
			95	Lifting Chain	DIN 1.0040, 5m

## 150-TR3

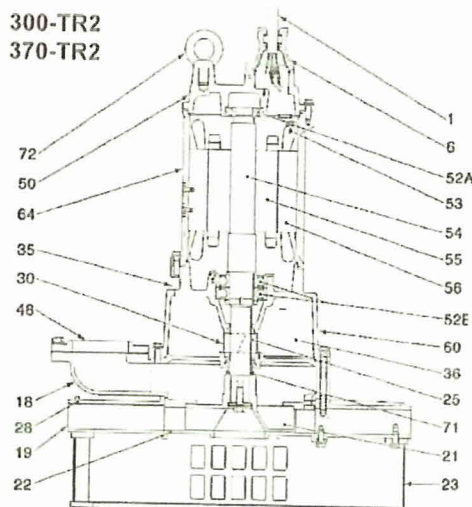


No.	DESCRIPTIONS	MATERIAL	No.	DESCRIPTIONS	MATERIAL
1	Cable Cable	H07RN-F	35	Lubricant	ISO VG32
6	Stuffing Box	EN-GJL-200	48	Screw Flange	EN-GJL-200
18	Air Passage	EN-GJL-200	50	Motor Bracket	EN-GJL-200
19	Guide Vane	EN-GJL-200	52A	Bearing Upper	Ball Bearing
21	Impeller	DIN GX5CrNi19-10	52B	Bearing Lower	Ball Bearing
22	Suction Cover	DIN GX5CrNi19-10	53	Motor Protector	
23	Strainer Stand	EN-GJS-450-10	54	Shaft	EN-X30Cr13
25	Mechanical Seal	Silicon Carbide	55	Rotor	
26A	Distance Piece	Carbon Steel Pipe	56	Stator Complete	
26B	Oil Seal	Nitrile Rubber	60	Bearing Housing	EN-GJL-200
28	Wearing Plate	EN-GJL-200	64	Motor Frame	EN-GJL-200
30	Oil Lifter	Plastic	71	Shaft Sleeve	EN-X5CrNi18-10
35	Oil Plug	EN-X5CrNi18-10	72	Lifting Eye Bolt	DIN 1.0040
			95	Lifting Chain	DIN 1.0040, 5m

## 220-TR2



No.	DESCRIPTIONS	MATERIAL	No.	DESCRIPTIONS	MATERIAL
1	Cable Cable	H07RN-F	50	Motor Bracket	EN-GJL-200
6	Stuffing Box	EN-GJL-200	52A	Bearing Upper	Ball Bearing
18	Air Passage	EN-GJL-200	52B	Bearing Lower	Ball Bearing
19	Guide Vane	EN-GJL-200	53	Motor Protector	
21	Impeller	DIN GX5CrNi19-10	54	Shaft	EN-X20Cr13
22	Suction Cover	DIN GX5CrNi19-10	55	Rotor	
23	Strainer Stand	DIN 1.0040	56	Stator Complete	
25	Mechanical Seal	Silicon Carbide	60	Bearing Housing	EN-GJL-200
28	Wearing Plate	EN-GJL-200	64	Motor Frame	EN-GJL-200
30	Oil Lifter	Plastic	71	Shaft Sleeve	EN-X5CrNi18-10
35	Oil Plug	EN-X5CrNi18-10	72	Lifting Eye Bolt	DIN 1.0040
36	Lubricant	ISO VG32	95	Lifting Chain	DIN 1.0040, 5m
48	Screw Flange	EN-GJL-200			

300-TR2  
370-TR2

No.	DESCRIPTIONS	MATERIAL	No.	DESCRIPTIONS	MATERIAL
1	Cable Cable	H07RN-F	50	Motor Bracket	EN-GJL-200
6	Stuffing Box	EN-GJL-200	52A	Bearing Upper	Ball Bearing
18	Air Passage	EN-GJL-200	52B	Bearing Lower	Ball Bearing
19	Guide Vane	EN-GJL-200	53	Motor Protector	
21	Impeller	DIN GX5CrNi19-10	54	Shaft	EN-X20Cr13
22	Suction Cover	DIN GX5CrNi19-10	55	Rotor	
23	Strainer Stand	DIN 1.0040	56	Stator Complete	
25	Mechanical Seal	Silicon Carbide	60	Bearing Housing	EN-GJL-200
28	Wearing Plate	EN-GJL-200	64	Motor Frame	EN-GJL-200
30	Oil Lifter	Plastic	71	Shaft Sleeve	EN-X5CrNi18-10
35	Oil Plug	EN-X5CrNi18-10	72	Lifting Eye Bolt	EN-X5CrNi18-10
36	Lubricant	ISO VG32	95	Lifting Chain	DIN 1.0040, 5m
48	Screw Flange	EN-GJL-200			

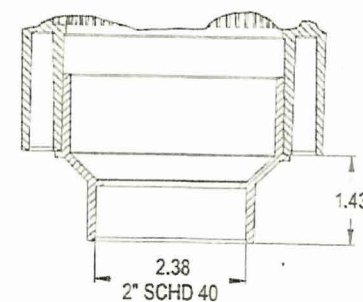
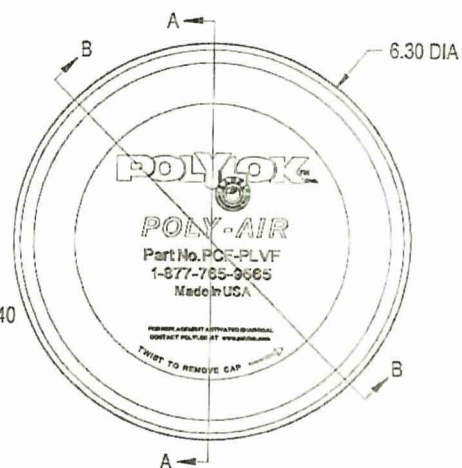
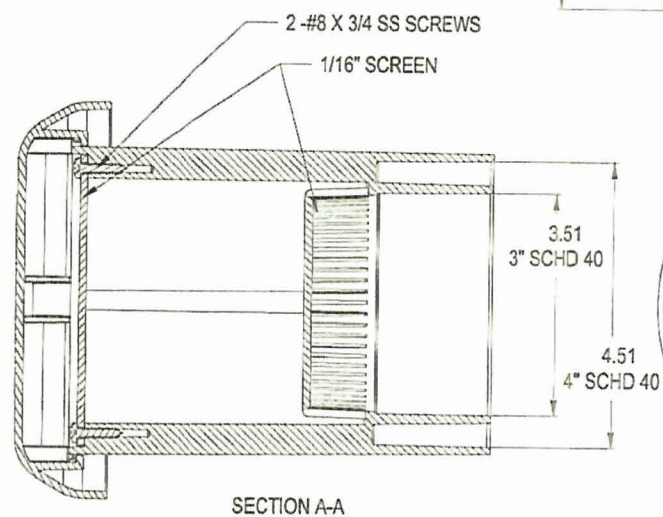
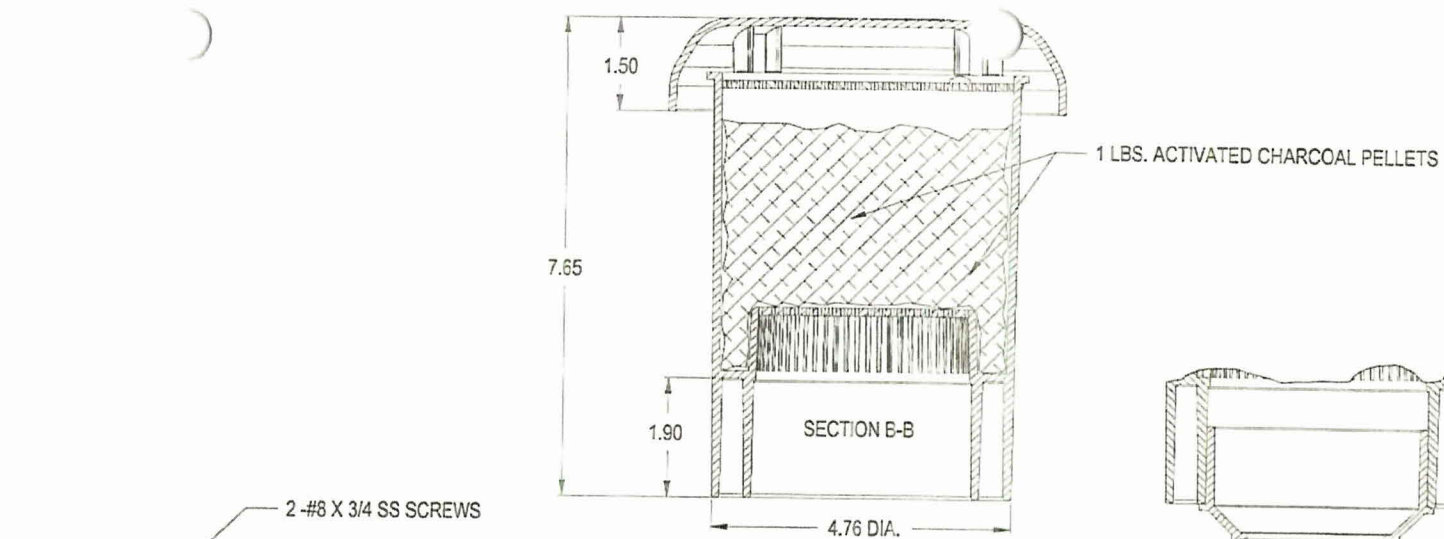
We reserve the right to change specifications and designs herein for improvement without prior notice. Our pumps are for professional use only. In the event that Tsurumi (Europe) GmbH have, in exceptional cases taken over, a manufacturer's warranty, this entitles the end-user to assert remedy free of charge against Tsurumi (Europe) GmbH due to any defect to the product occurring during the guarantee period (see below), also then when the warranty claims against the seller do not or no longer exist. In the event of malfunction, which is attributable to the improper handling by the end-user, no guarantee claim shall arise. Further claims shall not result from the warranty, unless if something to the contrary has explicitly been determined. The decision as to whether remedy is effected by way of replacement or repair shall be at the choice of Tsurumi (Europe) GmbH. The claims shall be time barred after a period of three months after expiry of the guarantee period, however, not before expiry of the warranty period which is valid towards the seller. In the event of doubt, the warranty period shall correspond with the warranty period which is valid between the end-user and his seller.

**Tsurumi (Europe) GmbH**

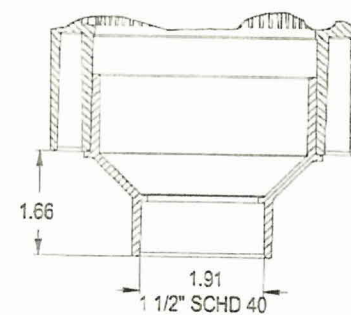
Heltorfer Straße 16  
D-40472 Düsseldorf  
Tel.: +49-211-4179373  
Fax: +49-211-4791429  
Email: sales@tsurumi-europe.com  
www.tsurumi-europe.com

Your Dealer

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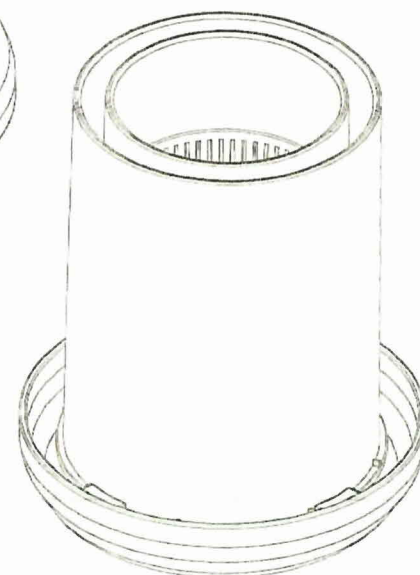
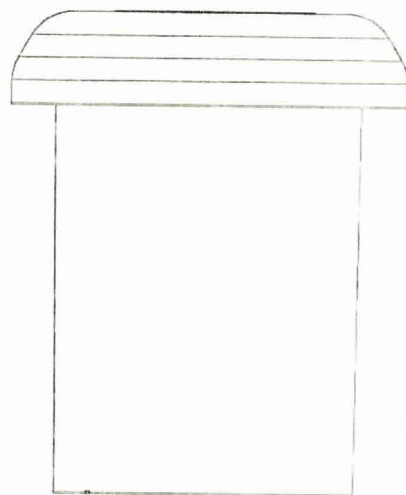
OPTIONAL  
2" REDUCER  
PART NO. PCF-PLVF-20



OPTIONAL  
1 1/2" REDUCER  
PART NO. PCF-PLVF-15

## POLYLOK ACTIVATED CHARCOAL ROOF VENT FILTER

PART NO. PCF-PLVF  
MATERIAL - ABS  
COLOR - BLACK





YOUR SOURCE FOR  
ENVIRONMENTAL  
SYSTEMS & EQUIPMENT

## COMMERCIAL PLANT, TANK SPECIFICATIONS

The basic plant structure is constructed of precast concrete modules with a compression strength of 5,000 psi and adequate reinforcing.

There are basically three (3) types of modules: Base Module, Ring Module and Top Module. Each module will measure 12' - 10" long x 6' - 10" wide x 30" to 34" tall (depending if is bottom, ring or top).

The procedure for erection of this module is to place the bottom module above a concrete slab with the proper reinforcement. Above that bottom section, the ring sections will be placed. Between each section an asphaltic joint will be installed between the grooves of each section. A cement mortar fill will be used to seal between tank sections.

Depending on the capacity of the plant the height of the tanks and the numbers of sections will vary. The maximum depth of the tank is 15' - 8" deep.

A set of modules will be erected vertically one beside the other with a separation of 2" and interconnected with PVC pipe accordingly to provide the desired tank capacity and flow pattern.

Structural detail are enclosed in the following drawings.

Medical Address: Carr. 876, Km. 1.2, Bo. Las Cuevas, Trujillo Alto, P.R. • Tel. (787) 761-7272 Fax: 748-0095

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NOTE: For 15' - 8" tank depth use two ( 2 ) #3 bars where called for in each location.

# II-PLANT CO., INC.

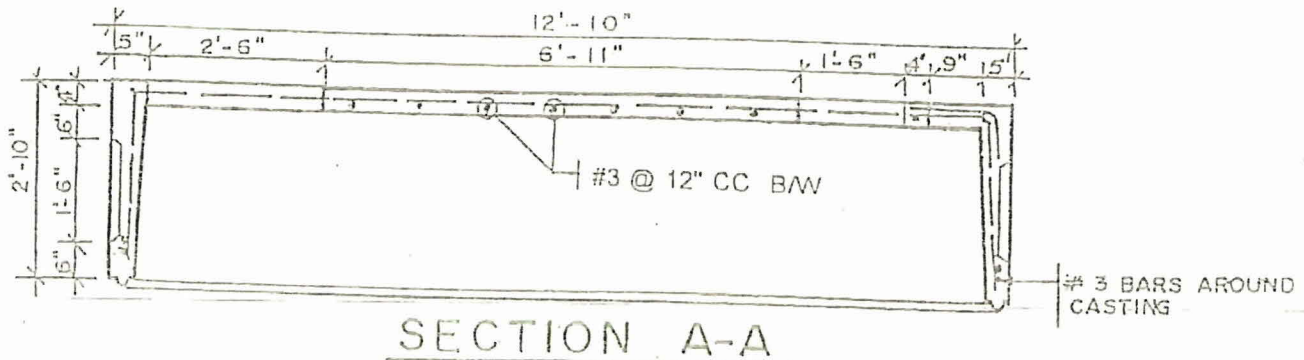
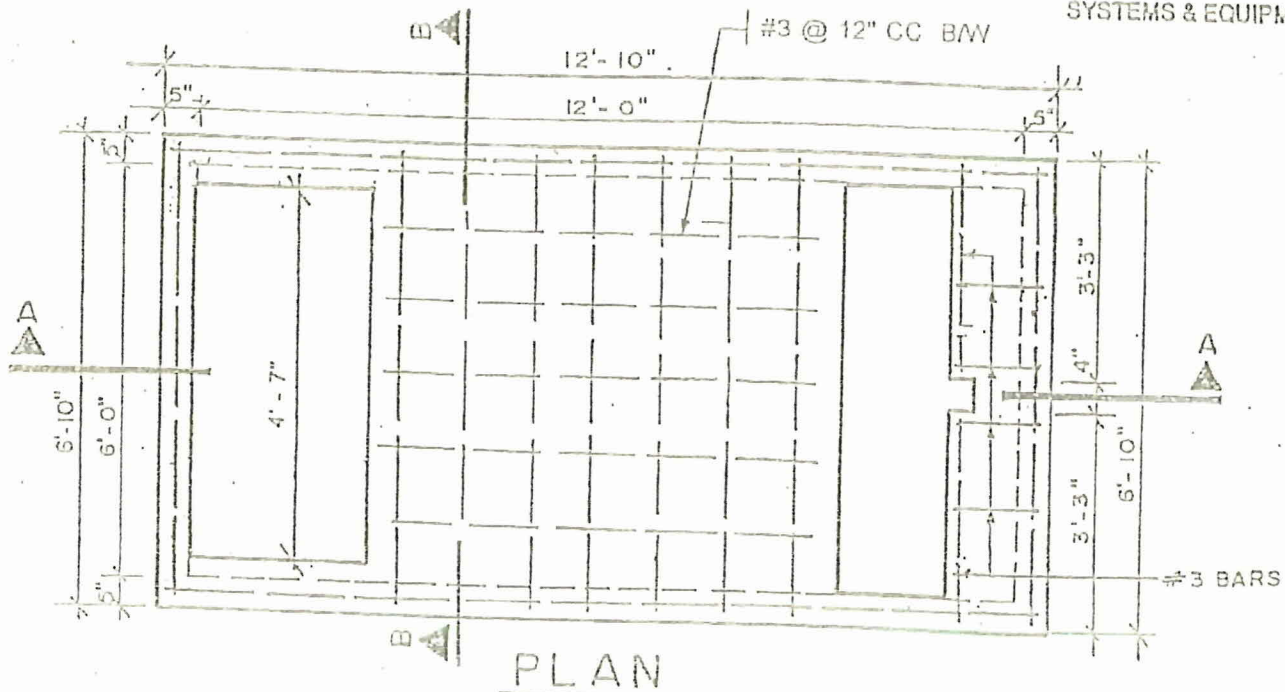
Address: P.O. Box 381, Trujillo Alto, P.R. 00977

Local Address: Carr. 876, Km. 1.2, Bo. Las Cuevas, Trujillo Alto, P.R. • Tel. (787) 761-7272 Fax: 748-0095

# SANI PLANT

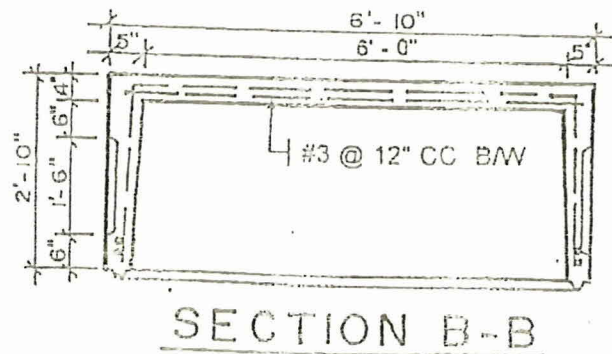
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## TYPICAL TOP CASTING



### REINFORCEMENT

1. All walls: 1 layer 6x6 (6/6);  
2 #3 around at bott.
2. Top: 1 layer 6x6 (6/6);  
#3 bars @ 12" c.c.
3. All mesh and rebar at panel midthickness.



# SANI-PLANT CO., INC.

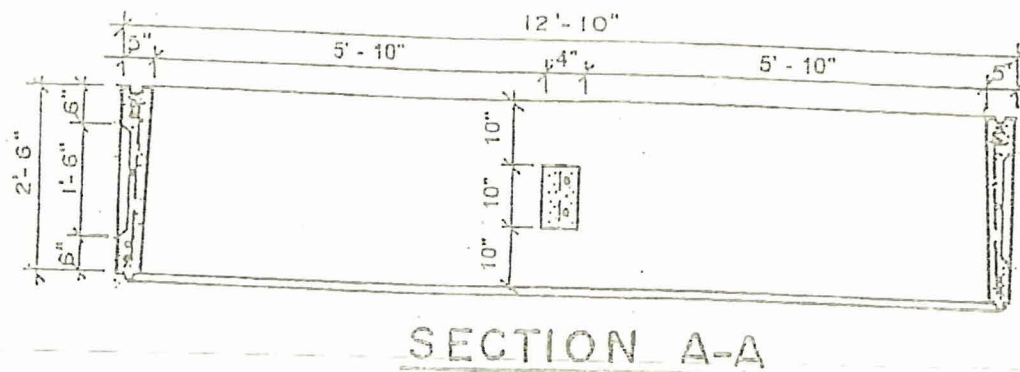
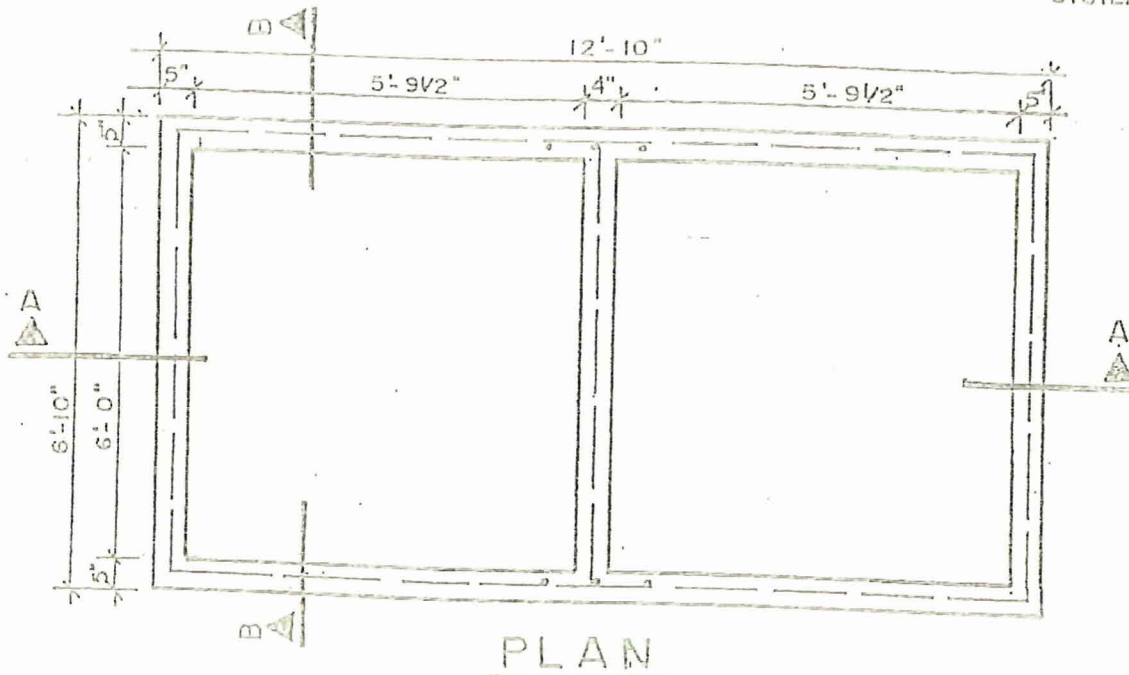
Address: P.O. Box 381, Trujillo Alto, P.R. 00977

cal Address: Carr. 876, Km. 1.2, Bo. Las Cuevas, Trujillo Alto, P.R. • Tel. (787) 761-7272 Fax: 748-0095

# SANI PLANT

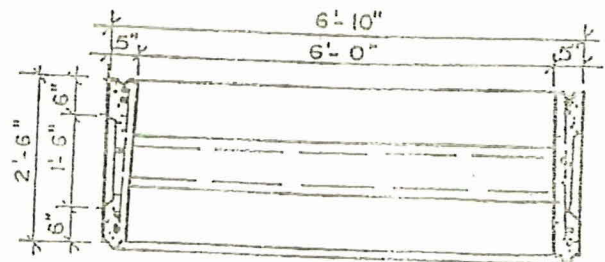
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## CASTING -JR.

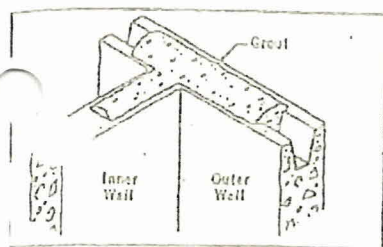


### REINFORCEMENT

1. Walls: 1 layer 6x6 (6/6); Use #3 bars around (2 bundled at top & 2 bundled at bott); 3 #3x24" long @ 6" o.c. vertically at partition.
2. Partition: Use 4"x10" partition; 1 layer 6x6 (6/6); 2 #3 longitudinally.
3. All mesh and rebar at panel midthickness.



inner walls or it will prevent proper setting of the tongue-and-groove joints. The grout poured in the groove



ould be a soupy mixture so that the grout of the casting above will settle properly into place. To prevent early drying, grouting should be done before setting the next casting. In grouting in cold weather, take precautions to make sure the grout does not freeze.

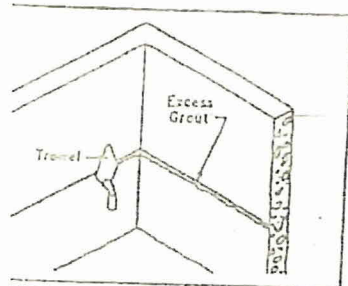
## ing Casting Placement

Refer to the "Casting Requirements and Installation" sheet for positioning the ring castings. It is extremely important to make sure castings with transfer and outlet holes are positioned properly so they will mate with transfer holes in adjacent castings inlet and outlet lines.

Set a ring casting, lower it into position and stop it about 2" or 3" above the casting under it. Push one end of the ring down so the tongue of the groove of the casting below fits into the sides of the ring casting. Push the casting underneath and lower it into place. All ring castings on one level should be set before proceeding to the next higher level.

## Completion

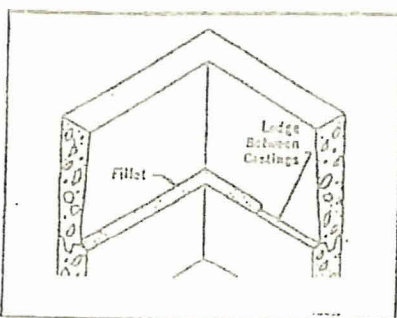
Grout is used for sealing it will fill out the seams on the inside and outside of the tank. Use a trowel to smooth out this excess grout and



SMOOTHING EXCESS GROUT

should be taken in grouting so a good seal is made and the tanks will not leak.

A small ledge is created on the inside of the tanks where castings are joined together. These ledges should be smoothed out by installing a grout fillet on this ledge so the casting walls blend together. It is important for

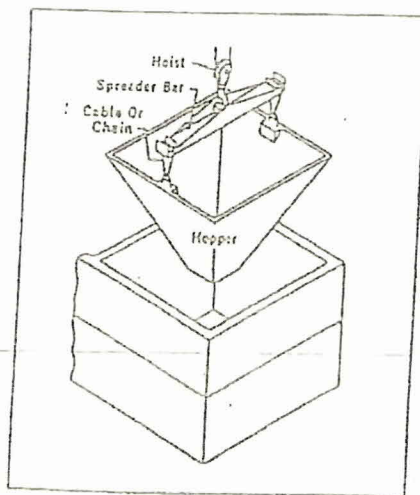


BLENDING WALLS TOGETHER WITH A FILLET

plant operation that casting walls and joints are smooth. Smooth surfaces prevent solids deposits, which can impair plant operation.

## Hopper Casting Placement

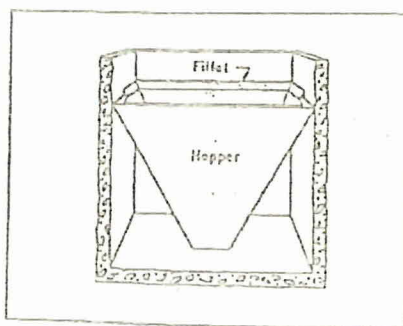
Refer to the "Casting Requirements and Installation" sheet for the correct positioning of the hopper castings. Hoppers must be installed after the second level of plant castings are in place. Always use a spreader bar when lifting hoppers to prevent the hopper from cracking or the lift eyes from being pulled out.



HOPPER INSTALLATION

The lift eyes in the plant hopper(s)

a grout fillet at the edge formed by the top of the hopper casting and the side of the ring casting.



HOPPER FILLET

## Final Ring Casting & Top Casting Placement

Refer to the "Casting Requirements and Installation" sheet for the correct positioning of the remaining castings. Be sure castings with transfer and outlet holes are positioned properly so they will mate with transfer holes in adjacent castings and inlet and outlet lines.

## Install Transfer Lines

Install transfer lines, transfer elbows and outlet couplings as shown on the "Casting Requirements and Installation" sheet and grout them in place. When installing a transfer elbow be sure the elbow is at a 45° angle pointing down and away from the plant outlet.

## Final Jobs

After tank setting is complete, place the equipment housings on the proper castings and piping packages on top of the plant with a crane or boom truck. Also, at this time do any other lifting that will require the boom truck or crane.

Inspect and clean the insides of all tanks to remove excess grout and any other foreign matter.

Install the plant mechanical equipment and fill the plant with water the same day the tanks are set. Any delay may result in the plant floating and could cause expensive damage. Naturally, care must be taken not to wash the grout out of the joints if it is still wet. Be especially careful of this if high pressure hoses are used.



750 Alpha Drive • Cleveland, Ohio 44143 • U.S.

Telex: 251616 JET UR • Fax: 216/442-9008

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TRUJILLO ALTO, P.R. 00977

PHYSICAL ADDRESS: CARR. 876 K 1.2

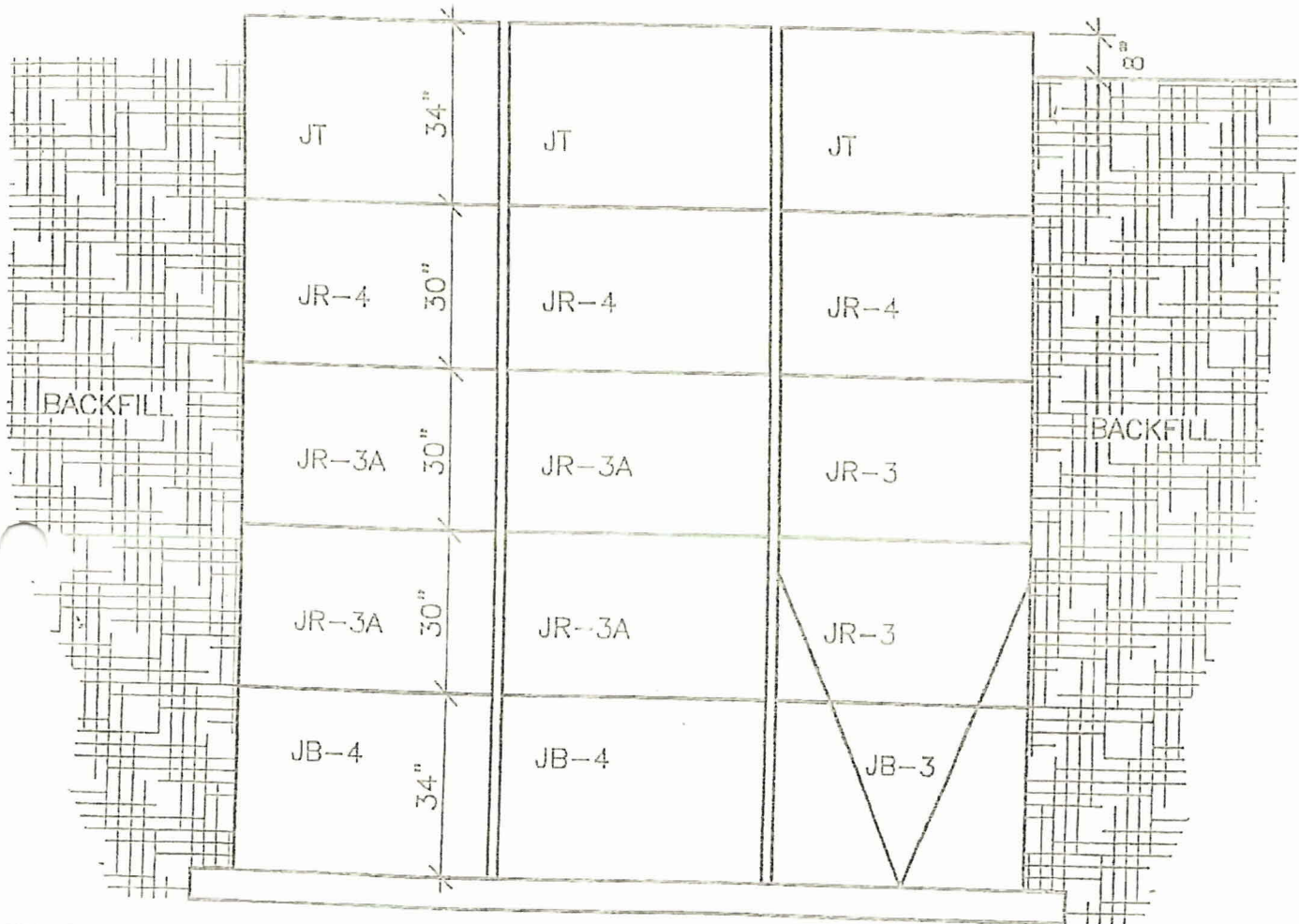
BO. LAS CUEVAS

TRUJILLO ALTO, P.R.

(809) 761-7272

AERATION OR EQUALIZATION

CLARIFYING



INSTALLATION TANK DETAIL

## IMPORTANT NOTES

### Notes Pertaining Fill Material Underneath Slab for Precast Tanks

- All fill material shall be A-2-4 or better and shall be compacted to 90% of maximum dry density (ASTM D-1557) in layers of 8" or less.
- Foundation bearing capacity should produce an allowable bearing pressure of 2,500 psf.
- The Contractor shall verify this condition prior to slab construction and notify Engineer in case of different condition.

### Notes on materials for concrete slab under precast tanks

1. Reinforcing steel shall be grade 60 ASTM A-615
2. Ready Mixed concrete shall be 4,000 PSI @ 28 days, ASTM C-94

### Notes on thickness of slab under precast tanks and reinforcing steel reqd.

1. Slab thickness 12"
2. Reinforcing steel shall be placed in two (2) layers of #5 bars @ 12"  
B.W. Cont.

<b>SANIT</b> A SERVICE OF ENVIRONMENTAL SOLUTIONS	PROJECT FOUNDATIONS FOR PRECAST TANKS		
	BY J.A.D.	DATE 1996	PROJECT #
	CHKD	DATE	SHEET OF

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Tel. (787) 761-7272

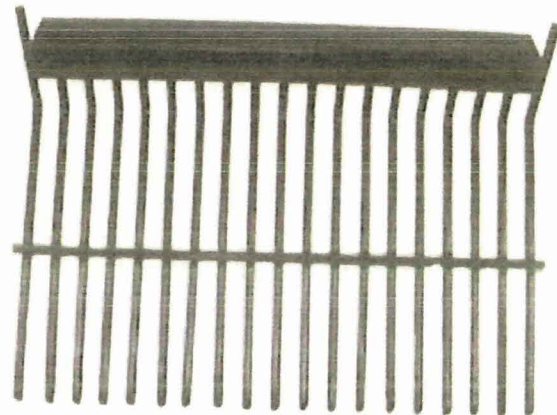


**REMOVABLE BAR SCREEN  
BASKET AND V-NOTCH  
OVERFLOW WIER**

ITEM	PART NUMBER
Fixed Bar Screen Only	8417024
Fixed Bar Screen with chamber cover	8417016
Removable Bar Screen Basket with support frame	8477010

### FIXED BAR SCREEN

Has 1" bar spacing with a built-in overflow in case bar screen becomes plugged. Designed for installation in a Jet Comminutor Casting, but can be modified for other installations.



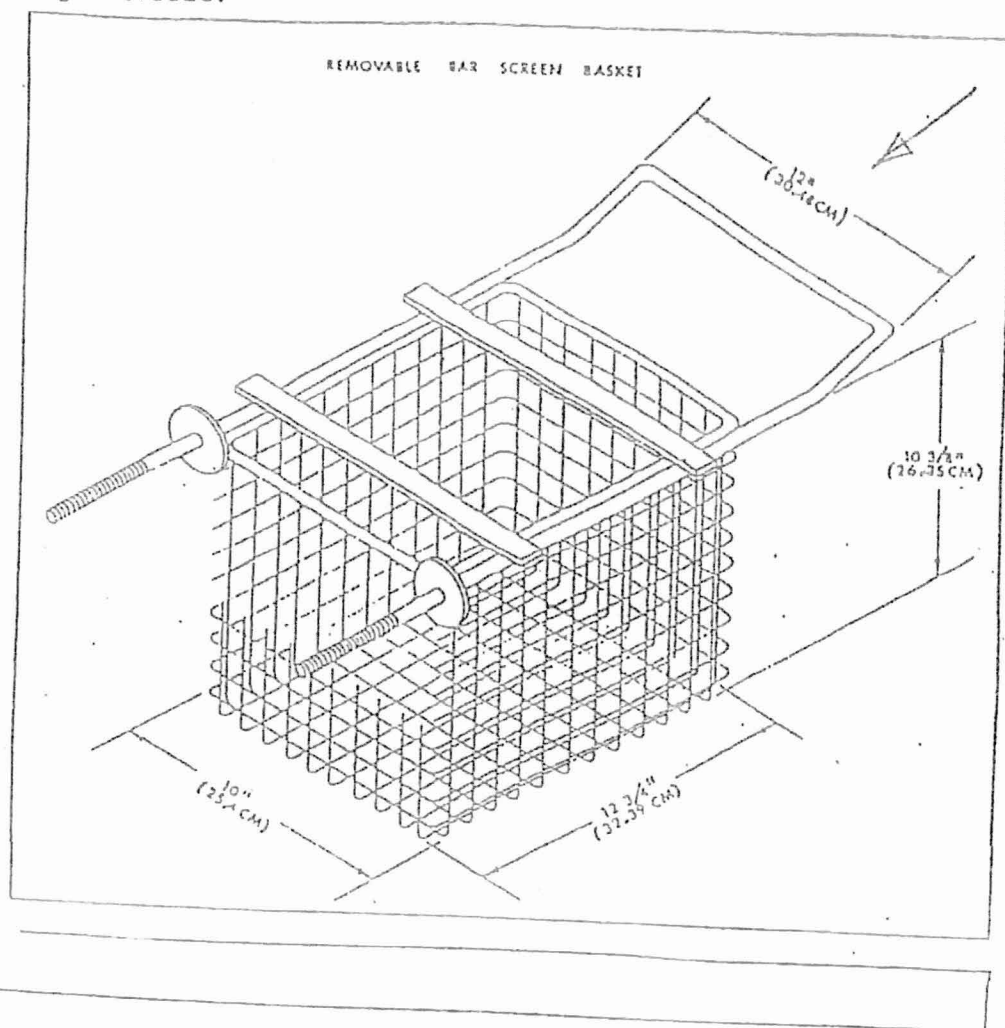
### REMOVABLE BASKET SCREEN

Designed to mount at inlet to plant with mounting frame supplied. Catches all solids which will not fit through a 1" square opening. Easily removable for emptying and cleaning. Can only be used on plants 4,000 gpd or larger.



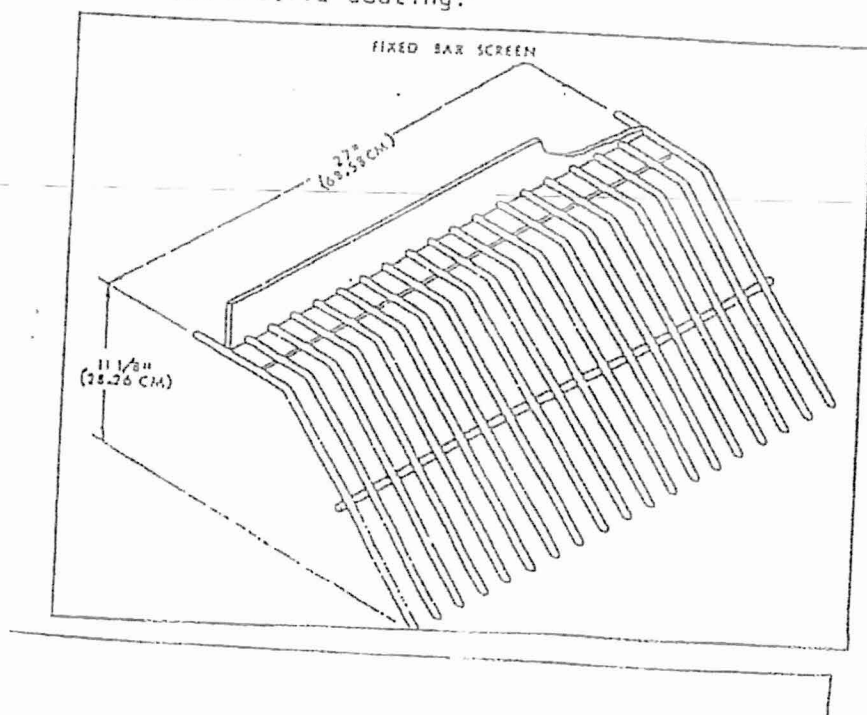
# REMOVABLE BAR SCREEN BASKET

Woven .120" diameter stainless steel wire with 1" x 1" openings. Mounting frame for wall mounting included.



# FIXED BAR SCREEN

$\frac{1}{2}"$  diameter rods on  $1\frac{1}{2}"$  centers.  $3\frac{1}{2}$  square feet of screen with built-in overflow. Coated with protective coating.



# Liberty Pumps®

## LE70-Series

### Sewage Pumps

**3/4 hp  
2" Solids-Handling**

#### Features:

- Rugged 2 vane, semi-open cast iron impellers
- Cast iron housings and volute with all stainless and brass fasteners
- 416 stainless steel rotor shaft
  - Oil-filled, hermetically sealed motors
- Built-in thermal protection on single phase models
- 2" or 3" flanged discharge
- Permanently lubricated upper and lower ball bearings
  - Unitized shaft seals
- Single float mechanical level control with series plug for manual bypass operation—standard on single-phase automatic models
- Adjustable pumping range
- Quick-disconnect 10' standard power cord allows replacement of cord in seconds without breaking seals to motor. (25' length optional)



#### Models:

##### SINGLE PHASE

LE71M 115V, 12a, manual  
LE71A 115V, 12a, automatic  
LE72M 208-230V, 6a, manual  
LE72A 208-230V, 6a, automatic

##### 3-PHASE

LE73M 208-230V, 4.1a, manual\*  
LE74M 440-480V, 2.1a, manual\*

\*NOTE: 3-phase models require control panel for automatic operation. See sewage accessories literature for complete information on all Simplex and Duplex controls.

evolve.



## **TABLET CHLORINATOR**

## Commercial Disinfection Systems

The Commercial Tablet Feeders are self-contained, chlorine dispensing systems designed specifically for the disinfection of effluent from commercial wastewater treatment facilities. Three models are available for chlorination of flows up to 100,000 gallons per day. Easily installed directly in the ground on the discharge line or on the inlet of a chlorine contact chamber, these tablet feeders use no electricity and have no moving parts. Chlorine dosage is automatically adjusted in proportion to the flow. On the larger two models the weir plates are calibrated in both Metric and English and enable the user to tell the flow rate at a glance.

A complete "Installation and Operation" manual containing detailed instruction is supplied with each Commercial Tablet Feeder. This comprehensive manual contains step by step instructions for easy set up, operation and maintenance.

### ADVANTAGES OF OWNING A COMMERCIAL TABLET FEEDER:

- **LOW INITIAL COST** - No need for complicated and expensive pumps, mixing tanks, control devices, electrical wiring or piping. The feeder is a simple, non-mechanical, gravity operated device.
- **LOW OPERATING COST** - Uses no electrical power. Labor costs reduced because there is no need for pre-mixing, pumps or control devices to maintain, adjust, repair or replace.
- **WARRANTY** - Each Jet Tablet Feeder carries a 10 year limited warranty against defective materials and workmanship.
- **EFFICIENT** - Chemical dosage is automatically varied in proportion to the flow. Higher flows expose more tablets to the effluent and correspondingly fewer tablets are exposed during periods of low flow.
- **AUTOMATIC (OPERATES UNATTENDED)** - The tablet feeders' unique design insures automatic mixing and chemical transfer 24 hours a day after initial adjustments have been made. It can go long periods of time between restocking.
- **YEARS AND YEARS OF REPAIR FREE LIFE** - The tablet feeders' simple, non-mechanical design has no moving parts to wear. Constructed of tough corrosion-proof plastics. Feed tubes and caps will not melt in the sun because they are protected by an enclosure with ultra-violet inhibitors.
- **SEPARATE ENCLOSURES NOT REQUIRED** - The self-contained and totally enclosed tablet feeder does not require a separate manhole, service box or casing when it is buried. Unique design prevents dirt and water from entering and makes the tubes easy to remove. For deep installations, optional risers are available which extend the tablet feeder to grade.
- **LONG LASTING TABLETS** - Efficient, slow dissolving chemical tablets do not "wick" and contain no dangerous gases, liquids or powders.

### HOW IT WORKS:

As the treated wastewater flows through the tablet feeder, it contacts the chlorine tablets which gradually dissolve and slowly release an even and controlled amount of active chlorine into the wastewater. If the flow rate increases, the liquid level in the tablet feeder rises and more tablets are immersed. If the flow rate decreases, the liquid level drops and exposes correspondingly fewer tablets to the effluent.

The rate of chlorination and the chlorine residual can be adjusted and after adjustment they remain constant and in proportion to the flow. If needed, adjustments can be made by varying the number of tablet feed tubes which are filled.

## Model 110 & 120 Chlorinator/Dechlorinator

ITEM	PART NUMBER
Model 110 Chlorinator/Dechlorinator	110
Model 120 Chlorinator/Dechlorinator	120

### MODEL 110 CHLORINATOR/DECHLORINATOR:

This durable and reliable commercial chlorinator is capable of disinfecting flows up to 50,000 gpd and up to 100,000 gpd when installed in parallel. The maximum flow rate on the Model 110 is 80 gpm (gallons per minute) and 160 gpm when installed in parallel. This unit has a 6 5/8" diameter inlet.

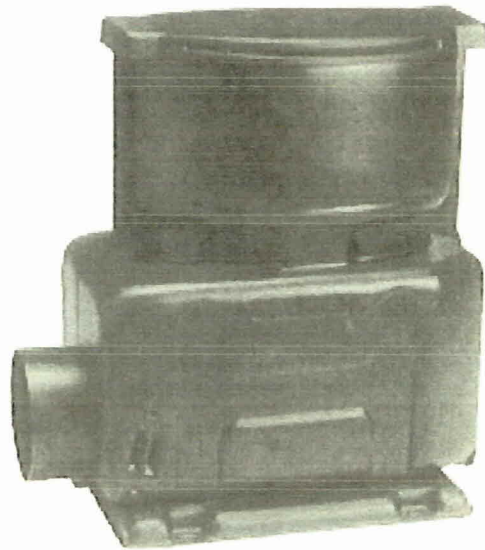
### MODEL 120 CHLORINATOR/ DECHLORINATOR:

This durable and reliable commercial chlorinator is capable of disinfection flows up to 50,000 gpd and up to 100,000 gpd when installed in parallel. The maximum flow rate on the model 120 is 80 gpm and 160 gpm when installed in parallel. Inlet diameter is variable up to 10".

Both models come equipped with the following:

#### FEATURES

- **MOUNTING** - each comes equipped with an easy mounting base for easy installation in a chlorine contact chamber
- **MATERIALS** - each is constructed with high density polyethylene, which is chemical and ultraviolet resistant
- **FEED TUBES** - each model contains 4-22 5/8" PVC tubes with a 3" inside diameter and caps. Each tube can hold 27 tablets
- **OUTLET WEIR PLATES** - three outlet weir plates ranging from 1" to 3" are included to regulate effluent level. Each plate is calibrated with Metric and English to enable the user to visually determine the flow rate
- **INLET BAFFLE** - Controls the direction and velocity of flow within the tablet feeder
- **LIMITED WARRANTY** - Every tablet feeder carries a 10-year limited warranty against defective material and workmanship

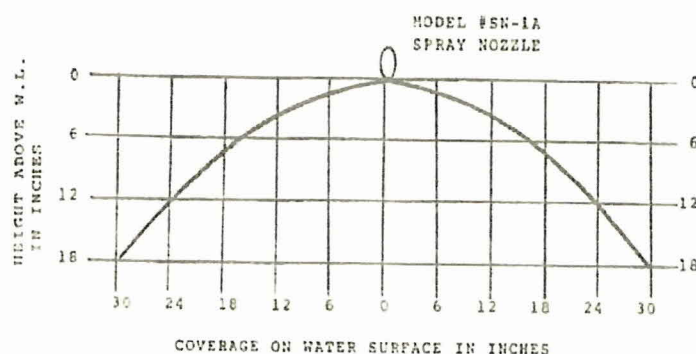
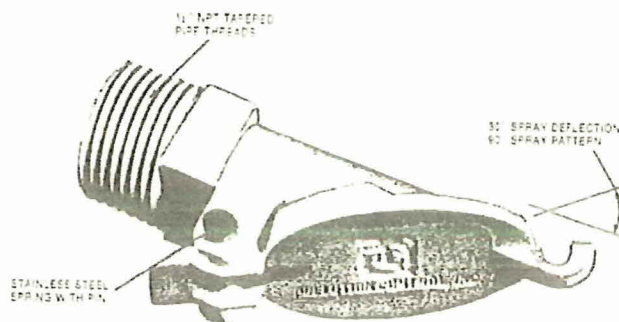


**SANI  
PLANT**

**FROTH SPRAY NOZZLE**

# SPRAY NOZZLE MODEL SN-1A

The Model SN-1A Spray Nozzle is used to control froth and foam in the aeration chamber. A series of these nozzles mounted in the water manifold, provide a uniform and continuous sharp flat spray along the entire length of the aeration chamber on the sides opposite the air diffusers. These spray nozzles have a variable capacity ranging from about 1 to 4 gallons per minute per nozzle when operating with the pump and piping furnished. The spray nozzles are spaced on approximately 5'-0" centers along the aeration tank sidewall. The spray nozzle operates as a counter-weighted device. The nozzle opens automatically with each start-up surge of the froth pump, which provides an instantaneous self-cleaning. The nozzle then pinches down on the water stream, producing a sharp flat spray at the nominal pump flow rate. The spray nozzle construction is a classic model of simplicity in a sturdy durable plastic with a stainless steel spring and pin and is trouble-free in maintenance, and easily installed in a 1/2" diameter pipe coupling.



Spray pattern for Model SN-1A Spray Nozzle, Typical (based on 2 GPM @ 2.7 PSI)

(Note: Diffused Gas Technologies, Inc. spray nozzles and equipment were formally marketed by Pollution Control, Inc. and are now marketed by Pollution Control Systems, Inc.)



## ALUMINIUM ACCESS COVERS

# SERIES S1R ACCESS DOOR

## STANDARD FEATURES:

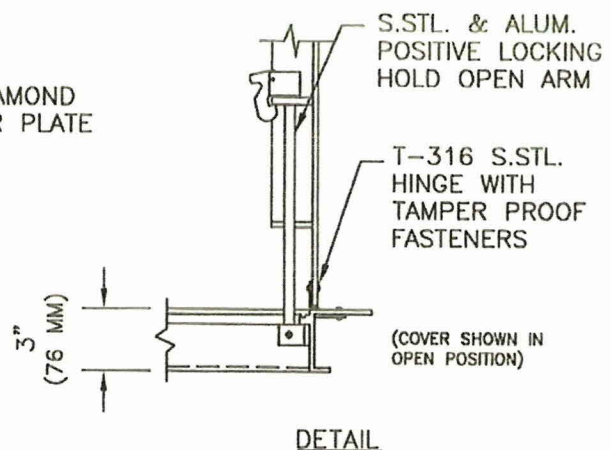
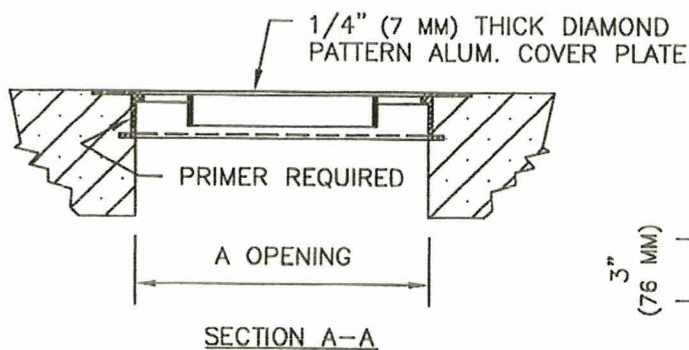
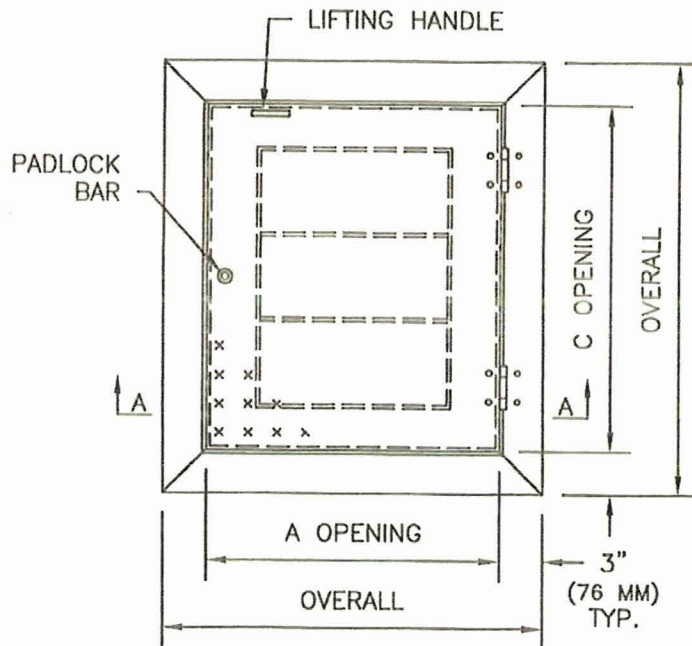
- AUTO-LOCK T-316 STAINLESS STEEL HOLD OPEN ARM WITH RELEASE HANDLE
- T-316 STAINLESS STEEL HINGES AND ATTACHING HARDWARE
- NON-CORROSIVE PADLOCK BAR
- SINGLE LEAF CONSTRUCTION
- 300 LBS. PER SQ. FT. LOAD RATING (1464 KG. PER SQ. METER LOAD RATING)
- EXTRUDED ALUMINUM FRAME
- RECESSED LIFTING HANDLE
- LIFETIME GUARANTEE



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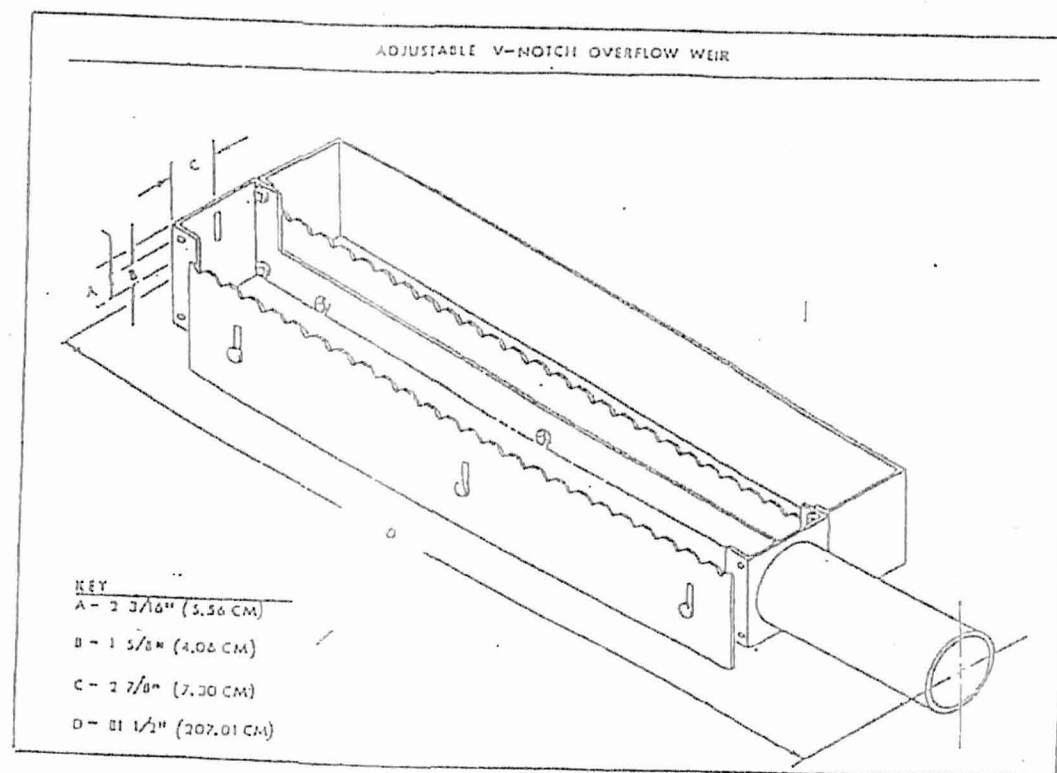
## STANDARD SIZES

QTY.	MODEL NO.	A DIM. INCHES (MM)	C DIM. INCHES (MM)	UNIT WT. LBS. (KG.)
	S1R2424	24 (610)	24 (610)	37 (17)
	S1R2430	24 (610)	30 (762)	42 (19)
	S1R2436	24 (610)	36 (914)	48 (22)
	S1R2442	24 (610)	42 (1067)	55 (25)
	S1R2448	24 (610)	48 (1219)	61 (28)
	S1R3030	30 (762)	30 (762)	49 (22)
	S1R3036	30 (762)	36 (914)	57 (26)
	S1R3042	30 (762)	42 (1067)	64 (29)
	S1R3048	30 (762)	48 (1219)	71 (32)
	S1R3054	30 (762)	54 (1372)	79 (36)
	S1R3060	30 (762)	60 (1524)	87 (39)
	S1R3636	36 (914)	36 (914)	65 (25)
	S1R3642	36 (914)	42 (1067)	79 (36)
	S1R3648	36 (914)	48 (1219)	85 (39)
	S1R3654	36 (914)	54 (1372)	91 (41)
	S1R3660	36 (914)	60 (1524)	100 (45)
	S1R3666	36 (914)	66 (1676)	109 (49)
	S1R3672	36 (914)	72 (1829)	116 (53)
	S1R4242	42 (1067)	42 (1067)	93 (42)



## ADJUSTABLE V-NOTCH OVERFLOW WEIRS

Constructed of non-corrosive aluminum with 5" outlet. Includes adjustable V-notch side plates and outlet baffle which mounts to either side. 52½" long weir provides 6 linear feet of overflow and 81½" long weir provides 11 linear feet of overflow.





# **SLUDGE RECIRCULATION PUMPS**

# Liberty Pumps®

## LE50-Series



### Models:

**LE51M 115V, 12a, Manual**

**LE51A 115V, 12a, Automatic**

**LE52M208-230V, 6.8a, Manual**

**LE52A 208-230V, 6.8a, Automatic**

Automatic models feature a mercury-free wide-angle float with series plug—allows for manual operation of pump separate from switch.

### Sewage Pumps

**1/2 hp  
2" Solids-Handling**

**112 GPM at 10' TDH  
25' Maximum Head**

#### Features:

- Heavy cast iron construction
- Oil filled, thermally protected motor
- Permanently lubricated bearings
- 2-vane, corrosion resistant \*HYTREL® impeller
- All stainless steel fasteners and rotor shaft
- Quick-disconnect 10' standard power cord allows replacement of cord in seconds without breaking seals to motor. (25' length optional)

\*HYTREL® is a registered trademark of DuPont Polymers

evolve.

# LE50-SERIES

## TECHNICAL SPECIFICATIONS

### PUMP

The pump(s) shall be model \_\_\_\_\_ as manufactured by Liberty Pumps, Bergen, NY, or equal.

The pump(s) shall have a capacity of \_\_\_\_ GPM at a total dynamic head of \_\_\_\_ feet.

Motor size shall be 1/2 horsepower, single phase, 60 hz. and \_\_\_\_ volt operation.

### MOTOR

The pump motor shall be of the submersible type, oil filled, hermetically sealed and shall be thermally protected. The overload element shall automatically reset when motor cools. Motor windings shall be of the class B insulation rating. The rotor shaft shall be made of 416 stainless steel and shall be supported by lower and upper ball bearings.

The power cord shall be of the quick-disconnect design allowing replacement of the cord without breaking seals to the motor and/or oil chamber.

### IMPELLER

The pump shall have a 2-vane semi-open impeller capable of passing a 2" spherical solid.

### SEAL

The shaft seal shall be of the carbon/ceramic unitized design, with BUNA N elastomers and stainless housings.

### EXTERNAL CONSTRUCTION

The pump volute, legs and motor housing shall be gray iron castings, class 25 or better. All fasteners shall be of 300-series stainless steel or brass. All castings shall be epoxy powder coated before assembly.

### LEVEL CONTROL

Automatic units shall be controlled by an adjustable, mercury-free, wide angle float switch. Float cord shall be equipped with a series plug for manual bypass operation.

MODELS	HP	VOLTS	PHASE	AMPS	DISCHARGE	AUTOMATIC	IMPELLER
LE51M	1/2	115	1	12	2" FNPT	NO	2-VANE SEMI-OPEN
LE51A	1/2	115	1	12	2" FNPT	YES	2-VANE SEMI-OPEN
LE52M	1/2	230	1	6.8	2" FNPT	NO	2-VANE SEMI-OPEN
LE52A	1/2	230	1	6.8	2" FNPT	YES	2-VANE SEMI OPEN

10' cord standard on above models. For 25' cord options, add a "-2" suffix to model number.  
Example: LE51A-2 for Model LE51A with 25' cord.

### DIMENSIONAL DATA:

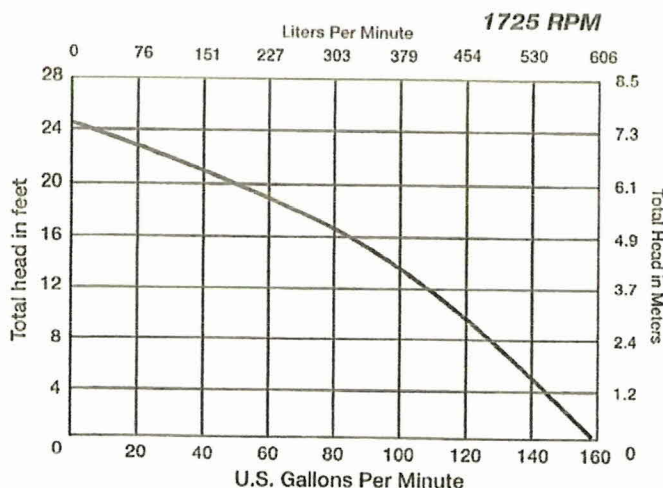
Weight: LE51M: 42 LBS.

Height: 14"

Major Width: 11.5" (manual models)

Maximum fluid temperature 140° F.

### PERFORMANCE CURVE 60 hz



Specifications subject to change without notice.

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# LE70-SERIES TECHNICAL SPECIFICATIONS

## ALL MODELS: 3/4 HP, 1725 RPM

### PUMP

The pump(s) shall be model \_\_\_\_\_ as manufactured by Liberty Pumps, Bergen, N.Y. or equal. The pump(s) shall have a capacity of \_\_\_\_\_ GPM at a total dynamic head of \_\_\_\_\_ feet. Motor size shall be 3/4 horsepower, \_\_\_\_\_ phase, 60 hz. and \_\_\_\_\_ volt operation.

### MOTOR

The pump motor shall be of the submersible type, oil filled, and hermetically sealed. Single phase motors shall have thermal overload protection embedded in the windings, and shall automatically reset when motor cools. Three-phase motors shall have heat breakers incorporated into the control panel, properly sized for the horsepower and amperage of the pump(s).

The rotor shaft shall be made of 416 stainless steel and shall be supported by upper and lower ball bearings.

The power cord shall be of the quick-disconnect design.

### IMPELLER

The pump impeller shall be cast iron, 2 vane, semi-open, and shall be capable of passing a 2" spherical solid.

### SEAL

The shaft seal shall be of the carbon/ceramic unitized design, with BUNA N elastomers and stainless housings.

### EXTERNAL CONSTRUCTION

The pump volute, legs and motor housing shall be heavy gray iron castings, class 25 or better. All castings shall be powder coated before assembly.

All fasteners shall be of 300-series stainless steel.

### LEVEL CONTROL

The pump shall be controlled by an adjustable mechanical switch sealed in a PVC float, and shall have a series plug for manual bypass operation.

	MODELS	VOLTS	PHASE	AMPS	DISCHARGE	AUTOMATIC
SINGLE PHASE	LE71M2	115	1	12	2" FLANGED	NO
	LE71A2	115	1	12	2" FLANGED	YES
	LE72M2	208-230	1	6	2" FLANGED	NO
	LE72A2	208-230	1	6	2" FLANGED	YES
	LE71M3	115	1	12	3" FLANGED	NO
	LE71A3	115	1	12	3" FLANGED	YES
	LE72M3	208-230	1	6	3" FLANGED	NO
	LE72A3	208-230	1	6	3" FLANGED	YES
3-PHASE	LE73M2	208-230	3	4.1	2" FLANGED	NO
	LE74M2	440-480	3	2.1	2" FLANGED	NO
	LE73M3	208-230	3	4.1	3" FLANGED	NO
	LE74M3	440-480	3	2.1	3" FLANGED	NO

10' cord standard on single phase models. For 25' cord option, add a "-2" suffix to model number.

Example: LE71A2-2 for Model LE71A2 with 25' cord. 25' cord is standard on 3-phase models.

NOTE: 3-Phase models require panel for automatic operation. See sewage accessories literature for complete information on all simplex and duplex controls.

### DIMENSIONAL DATA:

Weight: LE71M: 60 LBS.

Height: 14.1"

Major Width: 12.5"

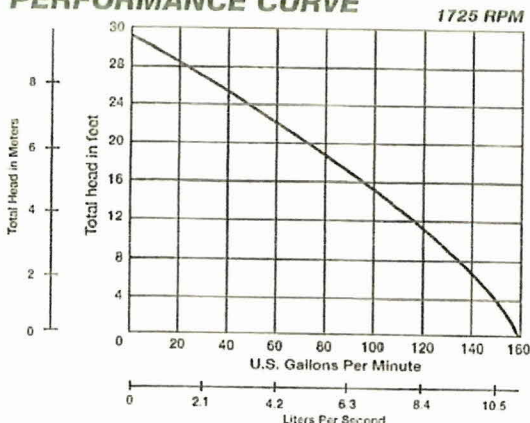
Maximum fluid temperature 140° F.

Dual Safety certification for the United States and Canada.



Specifications are subject to change without notice.

### PERFORMANCE CURVE



**SANI  
PLANT**

## **PLANT DRAWING**